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THE Society deſires it to be underſtood, that as a body, they are not reſponſible for any opinion or repreſentation of facts, contained in the following papers, and will be much obliged to any gentleman, farmer, or other perſon, that will be pleaſed to point out any error, or improvement in the ſeveral matters treated of, by letters addreſſed to their Acting Secretary, the Rev. DR. LYSTER, Hawkins-ſtreet, Dublin.

A

TREATISE

ON

FISHING

FOR

HERRINGS, COD, AND SALMON;

AND OF

CURING, OR PRESERVING THEM,

AS PRACTISED BY THE DIFFERENT NATIONS OF EUROPE.

EXTRACTED FROM SEVERAL AUTHORS.

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PREFACE.

THE fiſheries form excellent ſailors. Men accuſtomed to ſupport the fatigues, which the ſalt element continually requires, on which they paſs the greateſt part of their lives, embolden themſelves even to raſhneſs, and at length to brave the winds and the waves.

A grown up man may become a good ſoldier in one campaign, but to be a perfect ſailor, he muſt have been uſed to the ſea from his infancy; muſt form his conſtitution to an element, which is not natural to him, and muſt acquire an activity, which, in ſome circumſtances, is ſuperior to that of thoſe men, who get a livelihood by feats of ſtrength; it requires half his life to attain a thorough a knowledge

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knowledge of his profeſſion; nothing but emulation can make him ſurmount all theſe difficulties.

A fiſherman's ſon longs, from his childhood, to follow his father; he familiariſes himſelf, by degrees, to an element, which is to furniſh his ſubſiſtence. After braving the dangers of the ſea, they become naturally courageous, and the moſt uſeful ſubjects of a maritime ſtate. Having ſerved their firſt apprenticeſhip in boats, they uſually paſs into the merchants ſervice, as ſailors, and from thence to ſhips of war. Fiſhermen, by toiling on our coaſts by night and by day, make excellent coaſting pilots.

The ſea ſhore preſents many different objects. Here are very high and ſteep rocks; there the rocks have leſs elevation, and are ſometimes covered over by the high tides: in other places there are downs, or great mountains of ſand; ſome coaſts are formed by earths, more or leſs hard, mixed with ſtones, which, falling into the ſea, grow round with the frictions of the waves.

waves. Very extenſive flats are alſo found, made up of ſand, mud, or ſtones, which, having a gentle ſlope, are covered to a great diſtance by the tide. Here and there are to be found the mouths of rivers, creeks, and little bays, which ſerve for ſhelter to the fiſhermen in a ſtorm. In getting farther from the coaſts, the ſame varieties are found under water again; ſmall iſlands, riſing above the ſurface of the ſea, form little archipelagoes, where the fiſhermen may land; others, being at a ſmall depth under water, cauſe breakers, which foretell very dangerous ſhelving rocks, or ſands.

The bottoms of the ſea are rock, ſtones, gravel, ſand, fragments of ſhells, clay, mud, ſea-plants, &c. It is very eſſential to fiſhermen, to know theſe varieties, as alſo the depth of water, whether the anchorage be good, what kind of fiſh are to be found there, and what courſe they muſt ſteer in the night, either for fiſhing, or to regain the coaſt.

This knowledge they owe to a long and continued practice, which has enabled them to form a kind of chart in their minds, or rather a ſection of the ſea.

It is evident, that fiſhermen, who ſo particularly know the ſhoals, which they frequent, and who, beſides, have experienced the ſtrength and direction of the currents, make the beſt *coaſting pilots*. The lead, with its bottom rubbed with greaſe, or tallow, tells them not only the depth, but the nature of the bottom, and is ſufficient to point out their ſituation: they know, for example, that in ſo many fathoms of water, rocky, ſandy, ſhelly, muddy bottom, &c. they are at ſuch a place, and by means of the compaſs, they again know the courſe they are to ſteer at night, to get into port, as well as if they ſaw the ſea-marks, land-marks, or the ſignals, that guide them by day.

It is for thoſe reaſons, that at Dunkirk, and in all the other ports, where great fiſheries are eſtabliſhed, the Chambers of commerce of France furniſh the oldeſt fiſhermen

fiſhermen for pilots to the ſhips of war going to the North.

In the marine department of France, there are alſo hydrographers, raiſed and paid by government, to teach the theory of Navigation to pupils, who, after an examination, and on the atteſtation of the hydrographer, are received pilots on board ſhips of war. Theſe ſchools are of the greateſt uſe, particularly to form pilots, who can take the height of the poles. Theſe are employed in long voyages. Some principles of navigation are alſo uſeful to coaſting-pilots; but it is the practice of fiſhing, which gives to theſe laſt a perfect knowledge of the bottoms, depths of water, and currents.

The beſt regulations made by the wiſeſt legiſlatures, for the protection of young fiſh, have been ineffectual: for example, if nets are ordered to be made with maſhes of certain dimenſions, (that young fiſh may eſcape) the fiſherman knows, that by increaſing the weight at the bottom of the net, and preſſing the boat with a little more

more ſail, the maſhes will cloſe, and ſmall fiſh and large are equally carried down to the cod of the net, whence none can eſcape. Therefore, in France, government has permitted the fiſhermen to form a kind of conſular juriſdiction among themſelves, who are called *elders*.

It has appeared neceſſary to confide the police of fiſheries to theſe *elders*, as the judgment in fiſheries depends upon an infinity of combinations, which can only be known to thoſe, who have a long time followed the profeſſion.

All diſputes between fiſhermen, relative to the exerciſe of their trade, is determined by them, without appeal, and *Letters patent* are granted to them. Their laws, or rather their cuſtoms, are religiouſly obſerved, though not written, and their forms of judicature are very ſimple. For example, at Marſeilles, when a fiſherman thinks he has a right to complain of another, he puts a penny only into the box of the luminary of St. Peter, and he makes a declaration, that it is to bring ſuch a one to judgment

judgment; he, that is ſummoned, is obliged to appear before the elders. Each lays down his reaſons. The men on board the two veſſels are called, and interrogated, and on their depoſition, judgment is immediately pronounced and executed; for, if he, that has been condemned, refuſes to ſubmit to what has been adjudged, his boat is ſeized, and he cannot exerciſe his trade, until ſuch time as he has ſubmitted to the ſentence; but the coſts are reduced to the one penny only, which have been given to the luminary of St. Peter.

It were to be wiſhed, that this ſubaltern juriſdiction was more general, as it appears to be conformable to the ſimple law of nature. They ſhould be obliged to ſuppreſs the abuſes, which tend to the deſtruction of fiſh, and it appears eſſential to preſerve to the elders the ſmall privileges granted them, and which are the only honourable recompence of their toils and labours.

As the elders at Marſeilles conſidered what might render the fiſheries more abundant, by preſerving the ſmall fiſh, they judged it neceſſary, at certain ſeaſons, to

to prohibit the uſe of ſmall hooks, that, by uſing larger, the ſmall fiſh might not be taken.

With this view, they ranged by claſſes, under different numbers, the hooks of different ſizes, ſo that each number ſpecified the ſtrength, height, and opening of the hooks, which were to be uſed for ſuch or ſuch fiſhing, and they had prohibited themſelves the uſe of thoſe, that were ſmaller, and which might take fiſh too young to be expoſed to ſale. This law, though not written, was excellently obſerved. When ſome *Catalonians* came to fiſh near Marſeilles with ſmall hooks, the elders perceiving the miſchief the derogation from their law produced, renewed the prohibition, and forced all fiſhermen to comply, both French and foreigners.

A very ſingular phenomenon is, that fiſh of paſſage, coming in regular ſeaſons, offer us much more abundant fiſhings than thoſe, which the native fiſh of our coaſts can furniſh. What riches are brought in, at certain ſeaſons, by mackarel, herrings,

herrings, pilchards, cod, and ſalmon! Though theſe fiſh are delicious eating freſh, they are ſo abundant, when they come on certain coaſts, that the greateſt part would be loſt, if they were not prepared after different manners. Fiſh ſalted, pickled, dried, or ſmoaked, forms a very conſiderable branch of commerce, and is of much more importance than freſh fiſh for the markets.

It is true, that the eſtabliſhment of a fiſhing company in Ireland has hitherto failed, notwithſtanding the great bounties offered by parliament.

Thoſe of France at firſt failed alſo, tho' the French were more ſolicitous in cultivating the fiſhing trade, than all the branches, which tend to increaſe their maritime power. When Lewis XIV. was moved to admit the Dutch and Engliſh fiſhing-boats into Dieppe, Dunkirk, &c. with herrings, the king anſwered: *No! By no means; if my people will have herrings, why do they not catch them, as the Engliſh and Dutch do?* Upon which the merchants

merchants of thoſe ports immediately fitted out veſſels, and took herrings ſufficient for all the country. From that time the French have taken every meaſure to improve their fiſheries, in which capital article of commerce they have been increaſing ever ſince the treaty of Utrecht, and have become our moſt dangerous rivals herein.

" About ten miles below Aſtracan," ſays the ingenious and public ſpirited Mr. Hanway, " is a ſmall iſland, called Boſ-
" makoff, remarkable for its large ſtore-
" houſes of ſalt, which is made about
" twelve miles to the Eaſtward of it. In
" this place are very large fiſheries. The
" firſt eſtabliſher of them was Tokin
" Demedoffa, a common carrier, who ſet-
" tled there about fifty years ago; his
" whole fortune then conſiſted of two
" horſes, but through his induſtry and
" ability, he became the greateſt mer-
" chant in that country. The crown,
" which, before his time, was a ſtranger to
" theſe advantages, has, of late years, be-

" ſides

" ſides the ſalt, engroſſed ſome of the " fiſheries alſo."

If a private perſon, a carrier too, with no larger fortune than two horſes, ſhould, by his induſtry and abilities, become the great inſtrument of eſtabliſhing ſo conſiderable a fiſhery at Aſtracan; what may we not expect from a well eſtabliſhed company in this country, with the aſſiſtance of government and wiſdom of parliament.

Nature is favourable to us. Our ſhores are bold, our coaſts high and eaſily diſcovered, and our anchor-hold is good. Our weſtern harbours, are preferable to thoſe of Holland, France, or Great Britain, and, as the wind blows, above one-half of the year, Weſterly, we are on the weather, and the French and Dutch on the lee-ſhore.

What a prodigious advantage is this? The wind, throughout the year, ſcarce ever interrupts us, while they don't enjoy the benefit of it above one-half: nor are our harbours

which amount to 3750 quintals per day, and for one hundred and thirty faſt days in a year, 487,500 quintals: which at the rate of five dollars, the current price, a little more or leſs, when foreigners ſell to us, amount to 2,437,500 dollars. And, if we add the great quantities of cured ſalmon, herrings, pilchards, and other fiſh from abroad, which is alſo expended in Spain, one may reaſonably imagine, that the money they annually drain from us, by this article, is above three millions of dollars: and it is one of the principal cauſes of our unhappy ſituation."

The fleets of our enemies are almoſt annihilated in this war. We are maſters of the Northern ſeas, and the Dutch dare not put out their buſſes as uſual, which may in great meaſure account for the plenty of herrings laſt year on our coaſt; for it is well known, that the Dutch uſed to meet the great columns of herrings more to the Northward, than any other nation; and by their nets, and caſting out the offals of the fiſh, to the Weſtward ſide of the column, they

they endeavoured to drive them to the Eaſtward, and ſo to their own coaſt.

Now this appears a favourable time to puſh on our fiſheries, and to partake of that wealth, which the Dutch and French have ſo long enjoyed.

Fiſhing with hooks moſt advantageous.

Hook-fiſhing may be practiſed on all kinds of bottoms, even in the midſt of rocks; at all ſeaſons of the year; and almoſt in all weather: for the ſea muſt run very high indeed to prevent this fiſhery.

Furthermore, it is within the reach of the meaneſt fiſherman, and at the ſame time it may be ſo extended, as to form one of the greateſt fiſheries carried on at ſea.

Beſides, it is beyond doubt, that this mode of fiſhing contributes leaſt to the deſtruction of the fiſh: it does not overturn and ſpoil the flats and herbage, where the fiſh depoſit their *ſpawn*, and where the ſmall fiſh retire to take ſhelter from

from the currents, and to ſcreen themſelves from the larger fiſh, that purſue them: therefore, this fiſhery does not hurt the places, which facilitate the growth of fiſh in the ſea or rivers.

It is certain, that, if this kind of fiſhery alone was practiſed, there would be always fiſh in abundance, and this is almoſt the only kind of fiſhing uſed at Mexico, where the ſea is remarkably full of fiſh; and at Cadiz, it is principally carried on in ſummer for freſh fiſh for market.

Net fiſhing wounds and bruiſes an infinity of fiſh, which, in that ſtate, cannot be tranſported to diſtant places. Nets are prodigiouſly deſtructive of fiſh, which neither turns to the profit of the fiſherman, nor to the advantage of the public. On the contrary, in hook fiſhing, the fiſh which takes the bait, is commonly ſufficiently big for ſale, is very freſh, and in a manner, ſtill alive when brought on ſhore, becauſe moſt of the fiſhermen uſing but ſmall boats, frequently run aſhore to land their fiſh, aud immediately return to their fiſhing

fiſhing. The fiſh-carriers, knowing the time, repair to the coaſt, and tranſport them far into the internal part of the kingdom, before they are ſtale. On the contrary, thoſe, which have been bruiſed and fatigued by nets, are often dead when taken out of the water, and if they have remained long in the nets, are often ſpoiled before expoſed to ſale.

The beſt conditioned fiſh, therefore, are thoſe, which are taken with hooks; and for this reaſon, they are bought at a higher price by the fiſh-carriers, than thoſe caught with nets.

If any fault can be found with hook-fiſhing, it is the conſumption of a great quantity of fiſh for baits, as they uſe ſmall fiſh of all kinds, ſometimes requiring ſix for one hook alone; this is certainly a great prejudice to the increaſe of fiſh on the coaſt: and as it often happens, that the fiſhermen are obliged to buy large ones, there are conſiderable expences, of which, ſometimes the produce of the fiſhery does not clear them.

But this may be ſaid to the advantage of hook-fiſhing, that they take almoſt all kinds of fiſh, as ſoles, plaice, dabs, brets, flounders, turbots, rays, &c. and almoſt all kinds of round-fiſh, ſuch as whitings, mackarels, mullets, cods, and ſometimes ſturgeons, porpoiſes, &c.

OF LINES.

For common fiſhing with the rod, fine lines are made with horſe-hair, or ſilk; but for ſea-fiſhing, when large fiſh are to be caught, that might cut the lines with their teeth, the end of the lines next the hook are made of horſe-hair, or of braſs-wire, ſometimes ſingle, ſometimes double, or elſe rolled in the form of a ſmall cord; ſometimes alſo, they are made with a kind of a ſmall chain. Lines made of hemp ſhould be tanned, not only to make them laſt the longer, but alſo that the fiſh, deceived

ceived by the colour, may take the line for ſea-weed, and be leſs afraid of it: with the ſame view, in France, they are ſometimes dyed green.

OF THE

HERRING FISHERY,

TRANSLATED FROM AN ESSAY IN DUTCH, ENTITLED,

BESCHRYVING VAN DE HARINGVISSCHERYE.

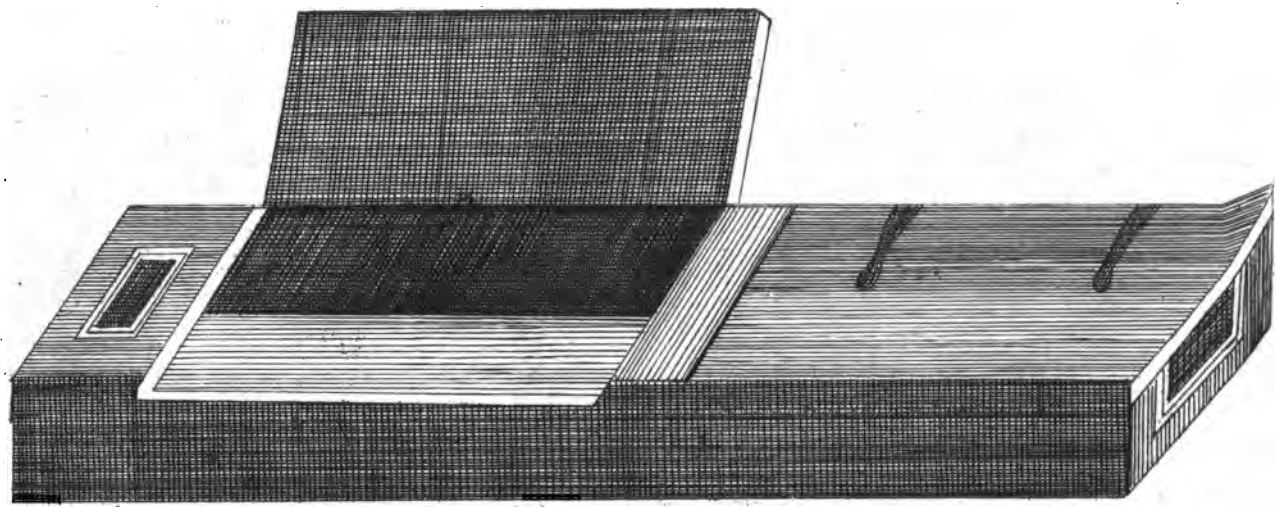
THE Herring inhabits the Northern ſeas, and probably amidſt the great Ice iſlands, ſpawns in the months of Auguſt and September, and multiplies ſo aſtoniſhingly, that notwithſtanding the great deſtruction of them by the fiſh of prey and men, the ſpecies is not ſenſibly diminiſhed. The herring belongs to that claſs which emigrate. They make their appearance yearly in prodigious numbers. The great ſhoal, in its progreſs from the North, divides into two principal branches; the right wing goes weſtward, falls towards the coaſts of Iceland in the month of March; the left inclines to the eaſtward. Theſe two grand diviſions are afterwards ſplit into ſeveral ſubdiviſions: ſome bend their courſe towards Newfoundland, others towards the coaſts of Norway, and partly fall into the Baltick through the Sound; while another part turns the North point of Shetland,

where it ſtretches along the coaſt, until it joins the diviſion (through the Belt,) which entered the Baltick. They ſeparate again, to cover the coaſts of Holſtein, the Texel, the Zuiderzee, &c.

The weſterly column, or right wing, which is alſo the greater, goes on ſtrait forward towards the Orcades, (where the Dutch fiſhers impatiently lie in wait for them) and from thence to Scotland, where they again ſeparate, one wing ſteering by the coaſt of Holland, England, and France, the other taking the route of Ireland. After paſſing all theſe iſlands, they again meet, and form into a column, which ſtretches along the Atlantic ocean and diſappears. But what juſtly challenges our admiration, is, that after ſeparating into ſo many different branches, they know how to rally their ſcattered ſquadrons, and find the way back to their native abode. The time of meeting, and the place of rendezvous, are ſettled, ſo that after the general retreat not one ſtraggler is to be met within theſe ſeas.

How regular ſoever the period of yearly emigration appears, it is not free from anomalies. It may appear ſurprizing, that theſe animals, who are ſecured from the perſecution of their enemies, in the unfathomable depths of the Northern ocean, by an impregnable rampart of ice, ſhould forſake their ſafe retreat yearly, in myriads, ex-

poſed



The Spawn Box for Breeding Fish. *Dub. Soc. Trans. v. 1. p.t 2.*

poſed on our coaſts to great and unavoidable havoc. Is it not a ſtriking inſtance of the goodneſs of divine providence, to draw this prodigious ſwarm of uſeful fiſh into our nets? This explanation, however pious, affords little light to the natural hiſtorian, who may be inclined to aſk; ſince divine providence is ſo gracious in this reſpect, why does it not ſend us a troop of whales to furniſh us with train oil at leſs labour and coſt, than we can now procure it? The celebrated burgomaſter of Hamburg, Mr. Anderſon, is of opinion, that the emigration of herrings is owing to the overflow of young ones, who not finding ſufficient room in their old habitations, ſally out in queſt of new ſettlements, as ſo many colonies. This opinion does not at all account for the phenomenon. How can periodical emigrations, always taking place at ſtated ſeaſons, proceed from ſo uncertain a cauſe as the mere accident of an overflowing population?

How will this hypotheſis account for the conſtant adherence to the ſame tract, the ſeparation and reunion of the main body, at ſtated places and at ſtated times? Whereas, mere want of room would drive them indiſcriminately towards any or all places. 2dly, So far from being the effect of exceſſive multiplication, it ſeems to be the motive of it. They are not the only ſpecies, which undergoes long voyages, for the ſake of propagation.

Many birds of paſſage, ſuch as the woodcock, wild gooſe, &c. do the ſame. In fact, the herrings multiply more on the route than they do before it; we know that many kinds of fiſh leave the ſea, and ſeek the rivers to depoſit their ſpawn; ſo that one very probable cauſe of the emigration, is the inſtinct of emigration, the ſecond the plenty of food, which the quickening influence of ſpring prepares, by the ſwarms of inſects and flies. The king, or leader of herrings, is much larger than the common, being two feet long; fiſhers think it criminal to deſtroy it; the whole column follows and obſerves his motions. In a ſtrait they contract, in an open ſea they expand their order of march with admirable dexterity, without ſlackening their pace. They live on ſmall fiſhes, and young crabs, as appears from their jaws being furniſhed with teeth: *Lewenhoeck* found in the ſtomach of a herring, the indigeſted remains of a little fiſh.

To form ſome conception of the innumerable multitude of herrings, that fill the ſeas, extending more than the breadth of England and Ireland together, and in order to give a clear inſight into this profitable branch of trade, we ſhall 1ſt, treat of the ſhips and implements uſed in the fiſhery. 2dly, Of the time and manner of taking them. 3dly, Of the regulations and right of carrying on the fiſhery, the gutting, ſalting, packing, &c. 4thly, Of the different ſorts and appellations of herrings, which make

make an article of commerce. 5thly, Of the inſpectors and overſeers of this commerce.

The veſſels employed in this fiſhery, are, time out of mind, called *Buizzen*. The Engliſh uſe a kind of veſſels, carrying from 60 to 70 tuns. The Dutch veſſels are from 25 to 30 laſts, ſome are 40, but ſeldom ſo much. Each of theſe have ten, twelve, or fourteen men aboard, who are hired at ſo much per week, except the ſteerſman, who receives 5 florins, for each laſt of herrings. The crew receive, over and above their pay, a preſent of herrings proportioned to the take, which preſent is the only wages of the younger part of the crew or apprentices. A Dutch fiſhing ſmack coſts new, about nine thouſand florins; the coſts of fitting for two voyages, are about ſix thouſand florins, and for three voyages, about eight thouſand. Mr. Semeyns computes the expence of fitting out a veſſel of 60 laſts (including prime coſt) to amount to 7,530 florins, to make three voyages in the courſe of a year.

Here

Here follows on accurate liſt of all the veſſels ſent out yearly, from 1763, to 1776, on an average of thirteen years.

	1763	1764	1765	1766	1767	1768	1769
Rotterdam,	7	6	6	2	2	2	2
Schiedam,	5	6	7	11	11	10	9
Ulaardingen	64	71	69	60	58	61	64
Maaſlandſluis,	7	14	15	14	15	12	12
Delfshaven,	7	9	9	8	7	7	7
Delft,	0	0	0	0	0	0	0
Enkhuizen,	40	40	40	40	41	41	41
De Ryp,	14	14	14	14	16	16	14
	144	160	160	149	150	149	149
Beſides Jaagers,	13	15	17	17	17	17	20

	1770	1771	1772	1773	1774	1775	1776
Rotterdam,	3	5	7	7	6	6	6
Schiedam,	8	7	7	5	3	2	2
Ulaardingen,	62	64	68	76	74	66	84
Maaſlandſluis,	14	14	15	18	18	17	21
Delfshaven,	7	7	7	7	7	6	6
Delft	0	1	0	0	0	0	0
Enkhuizen,	41	41	42	42	44	41	41
De Ryp,	14	14	13	13	14	16	16
	149	153	149	168	165	154	176
Jaagers	20	20	23	20	20	20	22

In 1774, the number of veſſels ſent out amounted to 165, and in 1776, to one hundred and ſeventy-ſix. From this brief expoſition of the number of veſſels employed in the fiſhery, it appears that a great decline has taken place ſince the year 1601, when 1500 veſſels were ſent out yearly from the United Provinces. The cauſe of this decline ſeems to be the greater attention, which other nations pay to this branch of fiſhery. It remains, however, certain, that the Dutch method of curing is ſuperior to that of their neighbours. The diminution of trade was neceſſarily accompanied by a proportional diminution of national profit; formerly thouſands were ſupported by this branch who are now out of employment. Government omitted nothing that could revive this declining branch of trade. Thus on the 19th of May 1775, the government offered a premium of five hundred florins for any ſhip, which ſhould be employed two years ſucceſſively in the herring fiſhery, and for the ſecond two years, 400 florins; yet ſome abuſes happened in conſequence, for ſome having got the premiums, diſcontinued to ſend out their veſſels. As the ſelling prices of herrings vary with the ſeaſon and plenty, it is ſcarce poſſible to aſcertain with exactneſs the profits of one voyage. We ſhall, however, attempt an average account, from which it will appear, that the herring fiſhery is worthy of every encouragement,

as

as a branch of induſtry highly advantageous to the community. A buſs of thirty-two laſts, fitted out for three voyages, coſts, as we already obſerved, between ſixteen and ſeventeen thouſand florins, each laſt of herrings contains twelve tuns, and each tun about eight hundred herrings; the whole lading then of the buſs amounts to about 380 tuns, and if each herring be eſtimated at half a ſtiver, (*i. e.* twenty florins the tun) the amount will be 7600 florins, which multiplied by three voyages, yields a ſum total of 22,800, from which 17000 florins being deducted for prime coſt, a ſurplus remains of 5800 florins for each buſs, all net profit:

Which multiplied by 160, the number of buſſes yearly ſent out to the fiſhery, yields little ſhort of a million of florins.

Let us in the ſecond place examine, with what inſtruments, and after what manner this amazing quantity of herrings is taken as ſoon as the buſſes are all aſſembled. They take their courſe from Shetland, N. N. E. and caſt the nets off Fairhill, on St. John's night, the 25th of June, after midnight. The fiſhery is always carried on at night, as well to obviate the inconvenience of the fiſh diſcovering the nets, as alſo to entice them by the light of the lanterns, of which they are fond, and towards which they make. Mr. Spon in his travels through Italy, makes mention of a ſimilar

ſimilar artifice uſed by the fiſhers, on the coaſt of Dalmatia; they carry lanterns in order to entice the ſardines, which are there in great abundance.

The nets are very long, conſiſting of fifty or ſixty webs, fortified with narrow net maſhes, in order that the herring may be entangled by his gills. The mouth of the net may be fortified with good hemp, or ſtrong Perſian ſilk, as being more durable than hemp, being capable of holding good three years: moreover they are tanned, or coloured brown with ſmoke, that they may be the leſs perceptible by the fiſh. The nets are thrown out at ſun ſet, betwixt two buſſes, which, on account of their ſize, require much time and labour. They are faſtened, and buoyed up with caſks to prevent ſinking, which ſerve as a diſtinguiſhing mark, and alſo, by reaſon of their weight, inſtead of an anchor. To prevent them from getting entangled in one another, the buſſes ſhould be ſo arranged, that each may preſerve its nets free. During night the fiſh runs into the nets ſpread out for them, and about five or ſix in the morning they are hawled up. This labour will give full employment for three hours, as the take is commonly from three to ten laſts, and ſometimes even fourteen laſts. The day is taken up in dreſſing the fiſh; they begin the operation by *cutting out the gills*, as thoſe parts are liable to ſpeedy putrefaction

faction; they are then put into barrels and ſalted; all that are taken under five laſts are thus prepared for the market. The overplus, which they call *ſtabers*, are alſo gilled, lightly ſalted, and thrown into boats to be ſent aſhore after the firſt ſalting. The herrings are left on deck throughout the following night. On the ſecond morning they are properly packed, and the barrels, being filled up, are placed in the hold. In the beginning a part of the take is ſent aſhore in the lighters called *Jaagers*. When the herrings are fully cured, the buſs herſelf goes towards land, diſcharges her freight, and lays in proviſion for a ſecond expedition. As experience has taught, that herrings caught at certain ſeaſons keep longeſt, and are beſt for uſe, the time for beginning the fiſhery is fixed by law. Before the 25th of June, all maſters of fiſhing ſmacks, previous to their departure from Holland, are bound over not to treſpaſs this ordinance, and at their return are obliged to declare upon oath, that they have not, by their own deeds or by the miniſtry of others, contravened the law. Teſtimonials of this are given to each ſhip, marked with the place of deſtination, to the end that none be deceived or the trade ſuffer by improper goods The place of the fiſhery changes with the ſeaſons. From St. John's to St. James's *i. e.* from the 24th of June to the 25th of July, the ſeat of the fiſhery is between *Fairhill* and *Shetland*; during this period herrings of the beſt quality are taken; from St. James's

James's day to the 14th of September, the purſuit is carried on to the north of Scotland, and from thence to the 25th of November, along the coaſts of Yarmouth and Norfolk. All the herrings taken the firſt three weeks after the 25th of June, are cured and packed up together, unſorted, and ſent to Holland by ſwift ſailing veſſels called *Jaagers*, after which all the herrings taken are carefully ſorted and ſeparated into three diviſions: *Maatijes* herrings, *full*, and *ſhotten* herrings, which are all ſeparately cured and packed up in diſtinct barrels.

In the *Maatijes* herrings is found neither roe nor milt. They are very fat and palatable, but dont keep well. *Full* herrings are thoſe, that are full of milt or roe, and in their moſt perfect ſtate; this ſort is fitteſt for market and preſervation. The third ſort conſiſts of ſuch as having caſt their ſpawn or roe are ſpent, or are on the point of ſpending; this laſt ſort is inferior in quality, and cannot be kept ſo long as the former, or full herrings.

The lading of the buſſes on their return to Holland conſiſts of thoſe three ſorts, which are again inſpected, packed, and ſalted afreſh, before they are ſent to any foreign market By this freſh packing fourteen ſea barrels are reduced to twelve, which make up a laſt. In order to bring this branch of commerce to a flouriſhing ſtate, the

the governments of this and many other countries have made ſundry regulations concerning the manner of cutting out the gills, ſalting, and packing, an account of which I ſhall lay before my readers.

The Engliſh have always looked on the commerce of Holland with an eye of envy, which often burſts out into open acts of violence, never omitting any opportunity of diſturbing, and, if poſſible, of ruining our herring fiſheries; the more ſo as Dutch herrings have always had the preference of the Engliſh, as well as of thoſe of every other nation. In order to cut off all pretext of quarrel, our fiſhers are forbidden to caſt their nets within ten miles of the Engliſh ſhore, which prohibition is the leſs detrimental to the fiſhery, as herrings of the beſt quality are taken at ſuch a diſtance from the ſhore.

Thoſe, which come into the bays of Norway, Shetland and Ireland, being of an inferior quality are leſs fit for preſervation or ſalting, for which reaſon it is forbidden by an ordinance, dated 1620, to take any herrings at the forementioned places. Among the regulations, that have been made for the ſupport of the herring fiſhery, the following are the principal ones.

The appointment of a hearmeeſter, or overſeer, at all the landing places where herrings are brought

brought in, to take ſtrict care that the herrings ſhould get a ſecond ſalting and packing; to him is alſo intruſted the inſpection of the ſalt and cooper's work, or barrels in which they are packed. Their province is in a ſpecial manner to prevent foreign herrings being mixed with our own, (in caſe any foreign cargoes arrive) and to have the barrel branded with ſuch marks as may prevent a miſtake on this *head*, that our trade may not ſuffer from the quality of ſuch fiſh.

2dly.—He is to take care, that all damaged herrings or of bad quality, *e. g.* ſuch as take ſick after having caſt their fry, or on the eve of doing it, in a word, unmerchantable, be thrown aſide in the packing, leſt ſuch bad fiſh corrupt the ſound or give them a bad flavour. That moreover the fiſh be properly ſalted and packed.—3dly. That the maſters and crew of one buſs do not put any hindrance in the way of another. In caſe they were unlucky, or could not ſucceed where they had caſt nets, they muſt not remove to the ground of others to diſturb their operations, nor damage their nets, boats, or other implements; in caſe they do, they muſt make good the damage. No buſs employed in the fiſhery can be ſold to foreigners, or hired out to them for the purpoſes of fiſhing. 4thly.—That the ſaid overſeer do inſpect all the barrels before they are taken on board the buſſes, reject ſuch as ſhall appear unfit, and mark ſuch as he approves with the name of the cooper,

and

and his place of reſidence; after having examined the quality of the timber, conſtruction, hoops, &c, &c.—5thly.—He ſhall not ſuffer any buſs out on the fiſhery before the 24th of June, and he ſhall require a declaration upon oath, before any of the herrings are landed, that there are none aboard taken before that period.

6thly.—He muſt take care, that in ſalting herrings a diſtinction ſhould be made. Thus, for example, the herrings taken between St. John's and St. James's day, ſhall be ſalted with coarſe and choſen ſalt. Thoſe taken from St. James's day to the 14th of September, muſt be packed up with the beſt fine ſalt. No herrings can be packed, except ſuch as are taken from the 14th of July to the 1ſt of January. Each ſort to be packed up ſeparately in barrels properly filled up, ſtopped, hooped, &c. Laſtly, no herrings can be ſold or brought to market in this country, that are not picked and ſorted in the following manner. By this ſorting and marking the different kinds of herrings, and the time they were taken, are diſcriminated and named accordingly: thus are to be met with in the market St. John's herrings, St. James's herrings, St. Bartholomew's herrings—none but theſe can be packed. The take of St. John is ſent aſhore in lighters, in order to be ſold immediately for conſumption.

The

The St. James's herrings undergo a ſecond packing, are reduced from fourteen barrels to twelve, then marked by the overſeers; theſe are ſent off in a commercial way.

The take of St. Bartholomew, the 28th of Auguſt, are marked with the arms of the city, and commonly ſent to Cologne in Germany. The take of the 14th of September are likewiſe marked with the arms of the city, and ſent generally to Rouen in Normandy; they are not marked, until they have remained in the firſt pickle eight or ten days. Laſtly, they muſt have remained in ſalt ten days, before they can be ſold. No Scotch, or other foreign herrings can be worked, cured, and packed, as if they were Dutch: they may be ſimply packed up in barrels without any ſtamp. The precaution on this head iscarried ſo far, that no empty barrels of ours, marked as above, can be exported to any other country. This extract of regulations concerning the important commerce of the herring fiſhery, poſſeſſed as well by the States General as by the ſtates of the province of Holland, is drawn from the Great Placart book, from the treaty with the city of Hamburgh, from the book of Handvoeſten, all which the reader muſt examine, if he requires a more exact knowledge of the matter.

We have ſaid above, that the inſpection of the curing, packing, &c. is entruſted to overſeers, who are appointed by government, and take up their

their reſidence conveniently to the harbours, or place where the buſineſs is going forward.

I have ſaid already and the common ſuffrage of all nations confirms it, that the Dutch herrings are the beſt. No other cauſe can be aſſigned for this general preference, than the ſcrupulous adherence to the regulations and proviſions juſt now mentioned, it being by no means true, that the art of curing, ſalting, and packing herrings is confined to the Dutch alone. Other nations are as expert at doing all that as we can be, but in no other country is ſo much attention paid to this branch of commerce as in our republic, which is of ſo much the greater conſequence to our ſtate, as the neceſſary expences of ſtores and fitting for the whale fiſhery are almoſt all defrayed from the profits *of it*. As long as theſe wiſe ordinances and regulations are punctually obſerved, and no breach of them allowed, notwithſtanding the high wages, which may be conſidered as one cauſe of its decline, it may *ſtill flouriſh*.

OF

OF THE

HERRING FISHERY,

TRANSLATED FROM THE FRENCH OF

M. DUHAMEL AND *OTHERS.*

Of the Spawning Seaſons.

IT is well known, that herrings do not all ſpawn at the ſame time, and it is generally obſerved, that in the years, that the air is mild, they ſpawn ſooner, than when the ſeaſon has been very cold. Sometimes, for inſtance, a great quantity of ſhotten herrings is caught in the beginning of December, whereas in other years, great numbers of full ones are found in January. This is a general obſervation; and if we inquire more particularly into the buſineſs, we ſhall find, that ſome herrings ſpawn much ſooner than others: ſo that in Octo-

ber, when almoſt all the herrings that come into the Channel are full, there are ſome ſhotten ones found among them.

Some fiſhermen think, that in the Engliſh ſea, the ſpawning ſeaſon is in October: this may be the caſe as to ſome herrings, but not as to the greateſt number. However, towards the middle of November they take ſhotten herrings at Yarmouth, though not in as great quantities as in the Channel, where ſhotten herrings are ſometimes found in the middle of October. The common opinion is, that herrings ſpawn but once a year, and that they come into our ſeas for that purpoſe. It is certain, that they ſpawn near our coaſts; and the condition of the eggs of the herrings, that are taken at Shetland, compared with that of the eggs of thoſe, that are taken at Yarmouth, and in the Channel, actually ſeems to prove, that they come into our ſeas on purpoſe to ſpawn. Nevertheleſs, if we conſider the immenſe quantities of them, that come from the North, we ſhall be inclined to think, that ſome of them ſpawn there. They are perhaps like the bees, that multiply in their hives, and ſend out ſwarms, when they become too numerous.

Shotten herrings do not conſtitute a diſtinct ſpecies from the others. They are thoſe, which have diſcharged their eggs or milt, and are therefore generally worſe than the full ones, on account of the ſickneſs that they are ſubject to at the time of ſpawning,

ſpawning, and becauſe the moſt of them are caught before they are recovered, whereas, the greateſt part of the herrings quit the coaſts a ſhort time after they have ſpawned.

Of the ſeaſons, in which Herrings are found in different places, and of the variations, that occur in the courſes they take.

In the beginning of ſpring, the inhabitants of the North take a great quantity of herrings in their own ſeas. In June and July, the fiſhery is carried on near the Shetland iſlands. In September and October, the fiſhermen take up their quarters at the entrance of the German ſea, and near the coaſts of the North of England; this is called the Yarmouth fiſhery. When it is over, they follow the herrings into the Channel in October, November, and December. It appears, therefore, that the herrings come from the North by the Orkney iſlands, and that after having touched upon the coaſt of Norway, they croſs the North ſea to come to the North of Scotland and England, whence they proceed through the Streights of Dover into the Channel, where the greateſt part of them ſpawn; after which they diſappear, and ſeveral are of opinion, that they return to the North along the coaſts of Ireland.

It having been obſerved, that the herrings leave the North towards April or May, the Dutch uſed

formerly to go in queſt of them near the iſland of Helygeland and the coaſt of Norway. But as that fiſhery often proved but middling, they don't ſet out now until June, at which time they go to meet them between Shetland and Newcaſtle.

OF THE HERRING FISHERY IN THE CHANNEL.

Of the Orders iſſued by the French Government, not to continue the Herring Fiſhery in the Channel after the month of December.

There are two things that contribute to the proſperity of a branch of commerce. The one conſiſts in meriting the confidence of the purchaſers, by taking particular care to have the article well conditioned, and above all, in obſerving great fidelity in the expediting of it; the other conſiſts in obtaining a preference, by keeping the article at a moderate price. It was with a view to theſe objects, that the Dutch having perceived, that the herrings caught between the rocks of Ireland, Shetland, and Norway, were not of a good quality, have prohibited fiſhing in thoſe places. They have alſo made regulations concerning their ſalt-works, ſo as to have ſalt of a good quality; and for the purpoſe of keeping it at a low price, they have not only no ſalt-tax, but they even give encouragement to thoſe, who carry on ſalt-works. And in France, the merchants, that cure ſalt-fiſh, get ſalt

at

at a moderate price, that they may be enabled to ſell their fiſh at nearly the ſame price that the Dutch do. For ſimilar reaſons regulations have been made concerning the time, that the herring fiſhery ſhould ceaſe.

The herrings come from the North of England into the channel; they are certainly poorer there, than they were in the North, or even on what is called the *Yarmouth coaſt*. However they are ſtill very good either freſh or ſalted; and as we have ſaid elſewhere, the fatteſt herrings are not the beſt for ſalting. The fiſhing for herrings has therefore been always allowed, from the time that they come into the Channel, until the latter end of December; but from that time it has been prohibited by ſeveral orders of government. We ſhall now mention the reaſons of this prohibition.

It is certain, that a great quantity of herrings ſpawn in the Channel, and eſpecially towards the Mouth of the *Seine*, in the end of the ſeaſon, whereby they loſe much of their good quality, particularly for ſalting. About that period there are ſome ſhotten ones taken, that are very good *freſh*; but when they have not had time to recover from the ſpawning ſickneſs, they dry up in the ſalt, and become what they call *horny*; whereas in October and November numbers of them are full and very good, either freſh or ſalted. This, however, muſt be underſtood of what uſually happens; for there are ſome late ſeaſons, in which the abundance

dance of ſhotten herrings does not come on, until January or even February. As ſalt ſhotten herrings were known to be inferior to the full ones, it was prohibited by a decree of March 24, 1687, to continue this fiſhery after the month of December, or to purchaſe herrings from foreign veſſels after that time; and in confirmation of this prohibition, another decree was iſſued in 1759, wherein is added an order not to bring any ſuch herrings to market, which has been ſince confirmed by ſeveral regulations.

The motives of theſe prohibitions were, that the herrings ſalted in that ſeaſon were bad, and that thereby all thoſe of the Channel were brought into diſrepute: that they were unwholeſome and cauſed diſeaſes: and that the fiſhing for herrings in that ſeaſon was deſtructive of the ſpecies.

There were ſome repreſentations made againſt theſe decrees, and the fiſhermen of ſeveral ports alleged, that herrings do not ſpawn on the coaſt of Normandy. But this plea could not ſtand, as it was manifeſtly falſe.

They added, that the *Iriſh* do not prohibit this fiſhery on their coaſts, where there are great quantities of ſhotten herrings. But ſhould the *Iriſh* be wrong in allowing it, it does not follow, that the *French* ſhould imitate them.

On the other ſide the herring merchants, who applied for theſe prohibitions, had probably their own advantage in view, viz, the ſelling their fiſh dear,

dear, rather than that of commerce. They alledged, that ſhotten herrings were unwholeſome and cauſed diſeaſes. But there is no foundation for this aſſertion, although we ſhall readily grant, that they are not as pleaſing food as full herrings.

And as to the third plea, viz. that the fiſhing for herrings after December was deſtructive of the ſpecies, it was a very nugatory one, not only becauſe the quantity of herrings, that the fiſhermen can take, is a mere trifle compared with the immenſe quantities of them, that are deſtroyed by multitudes of fiſh, that feed upon them, but alſo becauſe, were the multiplication of the ſpecies to be conſidered, it would be much more proper to prohibit the fiſhing for full herrings.

The only plauſible reaſon for making the abovementioned regulations was, that, as ſhotten herrings are not as good as full ones when ſalted, it was to be apprehended, that, if the taking and ſalting them were allowed, it would bring all the ſalted herrings of the channel into diſrepute, which would be very hurtful to trade. But ſtill it is hard, that the poor ſhould be deprived of an article of food, which could be procured very cheap.

The fiſhermen of Dieppe having repreſented, that herrings were abſolutely neceſſary for baiting their hooks, have obtained leave to fiſh for them with a few ſmall boats, under condition of cutting off

off the heads and tails of ſuch as they ſhould take. This favour has been granted alſo to ſome other ports. Now, if a regulation of this kind were generally adopted, it would be of great ſervice to the fiſhermen, and to the poor, without injuring the herring trade. For by taking care, that the heads of ſuch herrings, as are caught after December, ſhould be cut off, it will be eaſy to diſtinguiſh the good ones from thoſe of an inferior kind, and the purchaſers of ſalt herrings will be ſure not to be impoſed upon.

Of the circumſtances, thought to be favourable to the Herring Fiſhery.

The fiſhery is expected to be good, when after a troubled ſea there comes on a calm, accompanied with a miſt or thick fog; when the wind blows from the North or North Weſt, or rather from that part of the horizon, whence the herrings uſually come: for in theſe caſes they come ſooner and in greater numbers to our coaſts. Thoſe winds generally blow from a northern direction, and are the ſame that bring woodcocks to our coaſts, and, therefore, it is ſuppoſed that the herring ſeaſon will be good, when there is plenty of woodcocks.

When a great number of ſea-birds aſſemble in any particular place, it is an almoſt certain ſign, that there is abundance of herrings there. It is alſo a good ſign to catch *ſea-dogs*, as they follow the

the herrings to feed upon them. Another good ſign is, when the water is agitated to a certain depth; likewiſe when there are fat or greaſy ſpots, floating like oil upon the ſea, when not much troubled.

Lights kept in the fiſhing-boats are rather ſerviceable than hurtful to the fiſhery, but great lights coming from land drive the fiſh away. It is alſo to be obſerved, that the ebbing or flowing of the tide is immaterial, but that the greateſt quantity of fiſh is uſually caught, when the water is ſmooth.

Of the Pec Herrings, *or thoſe taken moſt early in the Northern ſeas by the Dutch.*

Theſe herrings are very fat and large; they are delicate and pleaſing to the taſte, and are good when ſalted; but as they are fat and oily, it requires much care to preſerve them, and they are never as white as the herrings, that are ſalted on our coaſts. There are but very few ſhotten ones found amongſt them. The greateſt part of them have milt or eggs, which are only beginning to be formed.

Of the Herring Fiſhery near Shetland.

The Dutch uſually ſet out for this fiſhery towards the middle of June, but never begin it until the evening of *St. John's day*. They don't fiſh

fiſh in the day time, and the manner of fiſhing there is nearly the ſame as that of the *Yarmouth fiſhery*. The beſt ſituation for this North fiſhery, is from the ſmall iſland of *Fairhill*, to the Northweſt of the *Orkneys* and round *Shetland*.

OF THE YARMOUTH FISHERY.

The Dutch and French carry on this fiſhery as well as the Engliſh, with this difference, however, that they are not allowed to come near the coaſt of England, in the vicinity of which the Engliſh fiſh themſelves. It is called the Yarmouth fiſhery, becauſe a great part of the herrings, that are caught by the Engliſh, are brought freſh to Yarmouth, where they are cured. This fiſhery is generally more profitable to the Engliſh than that of green or dry cod; and therefore to encourage it they have exempted it from all ſorts of duties. The fiſhermen take only a licence. As the Dutch and French are not allowed to bring their herrings to England, they ſalt them on board their buſſes.

Deſcription

Deſcription of the Yarmouth Herrings.

They are not as large or as oily as the *pec* or North ſea herrings, although they are originally the ſame. But they are firmer, their milts are larger, and the eggs better formed, on which account they are much better for ſalting and keeping than the *pecs*. For this reaſon, the Engliſh and Scotch do not fiſh for herrings at a great diſtance from land, where they are very fat. In fact, the Yarmouth herrings are the beſt of all for ſalting.

It is eaſy to conceive, that herrings loſe their fat and oil through the change of climate, water, and food. The different qualities, however, of cured herrings, depend very much upon the care, that is taken in ſalting them, as will appear hereafter. For inſtance, as it is a matter of great importance, that herrings ſhould be put in ſalt on their coming out of the water, thoſe, that the Dutch and French take in the Yarmouth fiſhery, have this advantage, becauſe ſuch, as are caught at night, are ſalted on board in the day time, which is not the caſe, when herrings are carried freſh into port, on account of the contrary winds or other accidents, that prevent the landing and delivering them, as ſoon as would be requiſite.

Of

Of the Herring Fiſhery on the coaſts of Ireland and Scotland.

The herring fiſhery of Ireland is very like that of Yarmouth, and the Iriſh ſea abounds with herrings from Auguſt to October. In Scotland, inſtead of ſmoking their herrings, as was formerly the cuſtom they make white herrings, either becauſe, on account of the herrings having removed from the coaſt, they are obliged to ſalt them on board their veſſels, or becauſe, white herrings are preferred in Italy.

Of the ſalting of Herrings at ſea.

The Engliſh, engaged in the Yarmouth fiſhery, keep very near the coaſt, and therefore bring their herrings to land ſoon after they are caught. But the fiſhers of the Channel, as they often go out far from land, and are therefore apprehenſive the fiſh may be ſpoiled before they can return to port, take with them ſome barrels of ſalt for the purpoſe of at leaſt corning the herrings, ſo as that they may keep for ſome days; however, this ſort of preparation is not ſufficient for the herrings, that they take in the North and Yarmouth fiſheries; they muſt be at leaſt caſked, and even barreled as far as poſſible. The Dutch and French, that go out on theſe fiſheries, practiſe this preparation, and the method of doing it is generally as follows.

lows. The Norman fiſhermen place the herrings in different compartments upon the deck: they open their necks a little with a ſmall knife, and take out the gills, and at the ſame time draw out the ſtomach and inteſtine; this is called *dreſſing* the herrings; they are then put into baſkets and carried behind to be poured into large vats with a quantity of ſalt. In theſe, the herrings and ſalt are ſtirred about, after which the herrings are put into tubs; but in this ſtate they could not keep many days, and therefore, when the men cannot return ſoon to port, they put them into barrels, preſſing them together as cloſe as poſſible. They are often obliged to go through theſe operations in too great a hurry, on account of bad weather, or for the purpoſe of clearing the deck &c. ſo that ſometimes they corn or barrel herrings, that were not dreſſed. There is an order of parliament againſt ſalting or barreling ſuch herrings. But, whatever precautions may be taken at ſea, the barrels muſt be emptied on land, and the herrings made up again with greater care, as will be explained hereafter.

Of the Salt uſed in the various methods of curing.

In whatever manner herrings are to be cured, ſalt muſt be uſed, but there are different ſorts of ſalt, ſome of which are not good for this purpoſe. The

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When the *Brouage* ſalt is old, and has become dry and ſweet, it leaves to the herrings their good taſte, without communicating any ſharpneſs, or breaking them, or making them tough or ſhrivelled. As to the ſalt of *Britany*, beſides what is uſed in the province, the Flemings and Picards take ſome of it, which they refine and make white. This refined ſalt is thought to be more ſharp and corroſive than the grey ſalt of Brouage; however for this very reaſon ſome people think it is advantageous to mix ſome of it with that of Brouage, when the herrings are fat and oily. Some uſe the ſalt brought back from Newfoundland. The reader may ſee what we ſhall ſay of this ſalt, in the Eſſay on cod fiſh. Provided it be not old ſalt that fell from the heaps of cod, it may do very well, particularly if care has been taken to dry it well in the ſun, upon ſails.

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This ſalt looks infinitely finer than that of Brouage, but is of a much inferior quality; and the Dutch, who know this well, ſometimes mix Brouage ſalt with Spaniſh or Portugueſe ſalt, which mixture is allowed to be preferable to pure Brouage ſalt, when the fiſh is fat and oily; and it is ſaid, that it contributes to the ſuperiority of the Dutch ſalt herrings. This may be true; we ſhall ſee however in the ſequel, that the perfection of the Dutch herrings in general, is owing to the great care they take during the whole proceſs of curing them.

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Of the Barrels for ſalt Herrings.

There is an order in Holland, that the barrels muſt be marked with the cooper's mark, and then examined in public by *juries*, who reject ſuch as are not of good wood, or which might give a bad taſte to the fiſh, after which the mark of the city is put upon them. There are alſo in France many regulations relative to the ſize, condition of barrels, &c.

A GENERAL

A GENERAL IDEA OF THE CURING OF HERRINGS.

The French, Dutch, and Engliſh cure herrings, ſome white and ſome red, and ſome like anchovies. But the French and Dutch cure but a ſmall quantity of red herrings in compariſon of the white ones; the Engliſh, on the contrary, redden the greateſt part of the herrings taken in the Yarmouth fiſhery.

We have ſaid already, that, when the fiſhermen are near enough the coaſt, ſo, as to deliver, in the day, the herrings that they catch at night, they ſell them freſh; but when this delivery cannot be made quickly, they corn them in the veſſels; ſometimes they throw them into caſks together with ſalt in a confuſed manner, and ſometimes pack them upon barrels. As theſe operations, which neceſſity ſometimes requires to be done at ſea, are executed better on land, we have reſerved a more particular account of them for this place.

Of half-ſalted, or, corned Herrings.

When the fiſhermen cannot bring their herrings to land within twenty four hours after they are caught, they give them a half-ſalting; it is an important point, that this ſhould be done almoſt immediately

mediately after the herrings are taken out of the water.

This half-ſalting is uſed likewiſe on land, when the herrings are to be cured either in the white or red way; when it is done at ſea, it is as it were proviſional, and ſerves to keep the fiſh for two or three days without ſpoiling. It is done in different manners. At ſea, as it muſt be done expeditiouſly, they don't *dreſs* the herrings, that is, they don't take out the gills and entrails; *which is very wrong*, as undreſſed herrings are fit only to be reddened, or half reddened. As to the half ſalting itſelf, it is ſometimes done in this manner: they put a ſmall quantity of herrings in a tub, and pour ſome ſalt upon them with their hands; upon this layer of ſalt they place one of herrings, and then another of ſalt, after which they turn both herrings and ſalt up and down together. Another method of doing it, is, to put a ſmall quantity of herrings with ſome ſalt in a ſort of copper pan, and then to mix and turn them about. Theſe half-ſalted herrings are ſometimes thrown pell-mell into a caſk, which is ſtopped up after a little ſalt has been put between the herrings; ſuch herrings will keep for a long time, provided they have been *dreſſed*, and that there be ſalt enough put into the caſks.

Sometimes the half-ſalted herrings are made up in bulk, by laying them on ſome part of the veſſel, after they have got the half-ſalting, and adding

a little more ſalt according as they are laid, and then covering the bulk with a ſail to prevent the ſalt from falling off. This method is not near as good as the former, and herrings made up in this way are only fit to be half reddened. But caſks are not to be had always at ſea, and it often happens, that the men have not time to dreſs the herrings, or to half ſalt them in a proper manner.

On land, the half-ſalting does not take place, until the herrings have been firſt waſhed, dreſſed, &c. and there are different methods of half-ſalting.

In ſeveral ports they pour a certain meaſure of herrings into a large tub, and immediately ſtrew upon them a thin layer of ſalt, which is repeated every time, according as other meaſures of herrings are put in, until the tub is full. They don't ſtir them, but let them take a proper proportion of ſalt, before they paſs to any other preparation.

In other ports, the women, after having *dreſſed* the herrings, put them in a trough, which is raiſed two feet above the ground, and is open at one end; this end is a little lower than the other, for the purpoſe of letting the fiſh ſlide out of the trough, after they have been half-ſalted. According as the herrings are put into the trough, the women ſtrew ſome ſalt upon them, and turn them, until every part of them is equally covered with ſalt. They uſe about 150 lb. of ſalt for every laſt, that is, from ten to twelve thouſand herrings.

When

When this operation is over, the herrings are drawn down into a baſket, which is placed in a tub, that receives the ſalt, which falls from the herrings. They are afterwards caſked, as ſhall be deſcribed in the ſequel.

Of the Operation of Dreſſing, *preparatory to the making of white Herrings.*

The herrings, that are delivered freſh to the ſalters, as likewiſe thoſe that have been half-ſalted at ſea are treated in the ſame manner, unleſs the herrings of the ſecond ſort have been dreſſed already at ſea, which would be of great advantage: for the herrings, that are ſalted before they are dreſſed, are much inferior to thoſe, that are firſt dreſſed and then ſalted; and in fact they never turn out well. There an order of the parliament of *Rouen*, prohibiting the mixing of them with the other ſort; the fiſhermen, however, find means to ſell them to thoſe who make red herrings. According as the freſh herrings are brought to the ſalting place, they are poured into large lavers full of water, ſome of which may contain ſeveral laſts of herrings. The women then ſet about *dreſſing* them, and firſt of all they take them one by one near the head in the left hand, and then preſs them between the fingers of the right, which they drawn downwards from the head to the tail, ſo as to cleanſe them and take off part of the ſcales; after which, raiſing up

the cover of the gills, they take them out with the firſt fingers, and along with them the ſtomach and inteſtine, ſo that nothing remains in the body but the *pey* or *milt*. They uſually make a light inciſion in the neck with a ſmall knife, but care muſt be taken not to cut off the head; for herrings thus mutilated would be thrown among the refuſe. According as herrings are prepared in this manner, they are put into baſkets, the *milt* herrings ſeparately from the *pey* ones, to be carried over to the man that is to ſalt them. All the offals are thrown into the ſea.

Of the Salter's buſineſs.

To freſh herrings, prepared as we have now deſcribed, the ſalters give a half-ſalting, ſuch as has been explained already. They then throw them without order into caſks or large barrels, which they fill up without preſſing the herrings, and let them ſink by themſelves for ſome hours; after which the coopers put on the heads of the caſks. This is called *caſking*, or *ſalting* in *urak*. The herrings are left in theſe caſks for a fortnight or three weeks. This preparation is much the ſame as that, which is uſed at ſea. During that period the herrings ſink and diſcharge their water, and there is formed a brine that covers them. Care muſt be taken not to let it flow off, for, if the herrings were left dry, they'd be ſpoiled.

Of

Of the manner of barreling Herrings.

When it is ſuppoſed that the herrings have got ſalt enough, they are taken out of the caſks, at ſea or on land no matter, and barreled. They are firſt poured out of the caſks into a laver, in which the women waſh them in their own brine. In the ports, where there is plenty of ſalt, ſome waſh them in new brine, which method appears beſt, becauſe the old brine, being mixed with the blood and lymph of the herrings, is more apt to be ſpoiled than the new brine. But if new brine be uſed, it ſhould not be too ſtrong. Be the brine what it will, the herrings muſt be well cleanſed from whatever dirt they may have contracted. They are then taken out of the brine with perforated pallets or boards, and left to drip in wide baſkets; when they have dripped ſufficiently, the ſame women take them one by one, and place them in the barrels, preſſing them as cloſe together as they can, and always placing the bellies uppermoſt. To preſs them the better (as it is of great conſequence that they ſhould be well preſſed) the coopers uſe falſe bottoms, upon which they jump, and ſometimes preſſing machines. This precaution is particularly neceſſary in the barreling of *ſhotten* herrings. 'Tis alſo to be remarked, that ſuch herrings as are parched, ſplit in the belly, &c. are thrown among the refuſe.

Salt

Salt is not generally uſed in the barreling of herrings; however, if the barrels are made up to be ſent by ſea to hot climates, a ſmall quantity of large ſalt is ſcattered between the beds of herrings.

In ſome ports they leave the barrels, after they have been headed, near one another with the bung-holes uppermoſt, through which they pour in at different times ſome of the brine, in which the herrings had been waſhed, after it has ſtood twenty-four hours in large caſks, to clarify by precipitation. The bungs are then cloſed, and the herrings are fit to be ſold.

It is to be noticed, that old brine, *clarified*, is preferred to new brine, and that ſome ſalters diſapprove of the cuſtom of pouring in brine by the bung-hole, for they ſay it makes the fiſh loſe part of the brine, which it had imbibed. But it does not appear how adding of new brine, ſhould make the herrings loſe their own brine; it is probable that new brine is preferable to the old, which is mixed with the lymph and blood of the herrings. But as ſalt is very dear in ſeveral ports, it is the intereſt of the ſalters to be ſparing of it.

Of curing Herrings in Brittany.

After having dreſs'd and half-ſalted them, they make them up in barrels, with a layer of ſalt in the bottom, upon which they place a row of herrings,

rings, then another layer of ſalt, and ſo on alternately, until the barrel is full, ending with a layer of ſalt. This quantity of ſalt forms a good deal of brine; and as in ſome time, the herrings ſink, they pour in new brine to fill up the barrels.

Salt is cheap in Brittany, and in fact, according to their method, much more ſalt is uſed than would be requiſite. But perhaps their herrings would not keep otherwiſe; for their method is in reality the ſame as that in *urak*, viz. mere caſking, which we have deſcribed already. It would be much better, if experienced ſalters were employed, who would regularly go through the operations, of which an account has been given in the preceding paragraphs.

Of the barreling of Herrings in Holland.

As herrings are ſometimes ſcarce near the coaſts of Holland, the Dutch fiſh for them towards Shetland, to the North of Scotland, or at Yarmouth; and as ſuch herrings cannot be brought freſh to Holland, the fiſhers ſalt them in caſks, and bring them home in that ſtate.

But whether the herrings be brought freſh or ſalted, the buſſes go up the canals, and the fiſh is delivered to the merchants.

Every merchant gets his herrings prepared before his houſe, the lower part of which is uſually a ſtore-room. If weather permits, the herrings are made

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A GENERAL

4. That the ſalting merchants do put their own marks upon the barrels—which is a very important point.

Of Red Herrings.

The Engliſh red herrings ought to be naturally the beſt of all, becauſe they are made of Yarmouth herrings, and therefore of the beſt kind; beſides that, they are of one night, becauſe they are delivered on the coaſt immediately after being taken, and none of them are ſalted in the veſſels. On the contrary, the red herrings, that are cured in France, are not Yarmouth herrings, (of which the French make white ones) but are caught near the coaſts of France, and they are of different nights. Yet, notwithſtanding theſe and ſome other circumſtances, the red herrings of the Channel ſell more and look better than the Engliſh ones, which is attributed to their being ſmoked with very dry beech; but they cannot bear navigation, or heat as well as the Engliſh herrings. The brown colour of theſe herrings, and their keeping better, may proceed from their being ſmoked and dried more than the French herrings; or it may be owing to their being fatter. This matter may receive ſome elucidation from the ſequel.

As to the Dutch, when the herrings do not come to their coaſts, as it happens in ſome years, they make white ones of all they take, both in the North

North and at Yarmouth; for they do not make red herrings, but of ſuch as are caught near their own coaſts, and which have not been ſold freſh.

Of the Utenſils, that are uſed in making Red Herrings.

There are large tubs, like thoſe which are uſed in the dreſſing of white herrings. There are, alſo, ſeveral ſorts of baſkets, ſome of which ſerve for the herrings to drip in, and ſome for other purpoſes, beſides a quantity of ſwitches, ſharp at one end, barrels, &c.

Of the Stoves, or Drying Places.

There are ſtoves of different dimenſions. Some of them are in the lower part of the houſes, others in the upper part. Some of them are ſmall ſeparate houſes covered with tiles, which are placed ſo as to let out the ſmoke. I ſhall deſcribe one of the largeſt of them. It is divided into three parts, by two rows of a ſort of ladders, raiſed about ſix feet above the ground, and which reach up to the roof. As the herrings are about ten inches long, the laths, which form as it were the ſteps of the ladders, are placed at the diſtance of eleven inches from each other, ſo as to leave an inch between the tails of one row and the heads of another. On thoſe laths or ſteps are placed the ſwitches

ſwitches, or little wooden ſpits, from which the herrings are ſuſpended. In each of thoſe ſpaces or funnels, in which the herrings are placed, there are two windows or vent-holes, which the director of the proceſs opens, whenever he thinks proper, to prevent the herrings growing black. To this circumſtance is probably owing the good colour of the French herrings. Underneath is a large hearth for the fire. The whole is cloſed up like a ſtove, but ſo as to admit a paſſage into it, when neceſſary.

Of the Curing of Red Herrings in France.

The ſpecies and quality of the herrings, whether red or white, are the ſame. The only difference is, that greater care is taken not to cure in the white manner, but thoſe of one or two nights, whereas red herrings are ſometimes made of thoſe of three nights, although they are not near as good for this purpoſe, as the herrings of one night.

They are not dreſſed, that is, the gills are not taken out, nor are they gutted, but they are half-ſalted; for which purpoſe, when they are brought from the boat, they are put in a ſtore-houſe on a large table, or on the floor, which muſt be very even. Two men turn about an hundred of them at a time with wooden pallets, whilſt another man throws ſalt upon them. In ſhort, they are half-ſalted in the ſame manner as the herrings, that are

to

to be cured in the white way, and this may be done in large tubs or otherwiſe. The Ordinance of 1680 allows for every laſt of herrings (between ten and twelve thouſand) three *minots* (about three buſhels) of ſalt. If they are intended for the provinces ſomewhat diſtant, they lie in the ſalt tubs for twenty-four or thirty hours; if for the Mediterranean, forty-eight hours, and for America, a little longer. After this they are waſhed with great care in freſh water. It is prohibited to waſh them in the brine of white herrings, or in that which flows off after the half-ſalting; if ſuch brines were uſed, the herrings would turn infallibly in three or four days time. Some perſons think, that weak brine, made with new ſalt, is preferable to water quite freſh, and they ſay, that it makes the herrings look well.

They are waſhed in baſkets, which are plunged ſeveral times into tubs of water. This is repeated, until the ſalt is diſſolved. According as they are waſhed and have dripped, they are ſpitted, that is, ſtrung by the head on the ſwitches. Care muſt be taken not to let them touch one another, ſo that they may receive the warm air and the ſmoke in every part. According as the ſwitches or ſpits are thus made up, they are handed to men, who place them in the ſtoves beginning from the top. The loweſt row of ſwitches is about ſix or ſeven feet above the hearth. When the rows are all made up,

up, they are left ſo for twenty-four hours, that the herrings may drip before the fire is kindled.

When the dripping is over, they light the firſt fire, which is kept up day and night without intermiſſion for fourteen or fifteen days, and inſpected every two hours for the purpoſe of adding fuel to it, or of ſtirring it; for an equal degree of heat muſt be kept up. The fire is alſo now and then puſhed from one part of the hearth to another. The management of the fire requires an experienced man, who can keep the fire always at the ſame degree of heat, and proportionable to the quality of the herrings. The fatter they are, the longer the fire muſt continue, but ſtill it muſt be a gentle fire; and it muſt ceaſe, when the herrings are fit for the next part of the proceſs.

After the fire has been kept for a fortnight, or ſometimes for twenty days, more or leſs, it is diſcontinued for three days to let the herrings diſcharge their oil, which is called the *piſſing of the herrings*. When this is over, the fire is lighted again, and kept going with the ſame precautions as before, for five, ſix, and ſometimes ſeven, or eight days. When the herrings are found to be perfectly dry, they are taken down and put on a table to be inſpected, picked, &c.

We may obſerve, that fifteen days in the drying place are ſufficient for the herrings, that are to be conſumed in France; but thoſe that are to be ſent

to

to the Mediterranean, require twenty or five and twenty days, and ſometimes more.

In the picking of them, ſuch as are ſhotten, too much dried, &c. are ſet apart, and ſold as refuſe to the hucſters, &c. The reſt are merchantable, and are barreled.

The fire muſt be made of wood, which produces great heat and ſmoke, but little flame. In ſome ports they uſe oak, in ſome beech, and in others alder. They take care to keep the door of the drying place conſtantly ſhut, and to warm the place gradually; for which reaſon they begin with lighting a fire in the middle of it; twenty-four hours after they light two other fires, and then two more, if the drying place is large.

Care muſt be taken not to let the herrings get too warm; however, about the end of the proceſs a ſmart fire is made to give them a perfect drying, and the entrance of the ſtove is cloſed with a large cloth.

Of the Preparation of Red Herrings in England.

The method of curing red herrings at Yarmouth is very nearly the ſame as that we have now deſcribed. But, as the Engliſh make red herrings of almoſt all thoſe they take, their eſtabliſhments for this purpoſe are generally larger than ours. Some of their drying places are fifty or ſixty feet high, and may contain ſix or ſeven hun-

dred thouſand herrings, which cauſes a great economy of wood and of hands.

When the herrings have dripped, the fires are lighted much in the ſame manner as in France, and are continued for thirteen days, after which the herrings are left for three days in *the piſs*. Then the fires are lighted again and kept for eight days, at the expiration of which they are left again in the *piſs* for four days, and then they get the laſt fire, which laſts three days.

Thus their herrings remain in the drying places for near five weeks, whereas, in France, this proceſs laſts only about twenty-one or twenty-three days. It is true, that, as the Yarmouth herrings are fatter than thoſe of the Channel, they take more time to dry, and that, if they were not dry enough they would corrupt, particularly if they were to be ſent to remote and hot countries.

Some people find fault with the Engliſh herrings, on account of their being of a darker colour, than the French herrings; but this is not a real imperfection, as their colour is owing to their being fatter, on which account, they muſt be kept longer in the ſtoves; ſome are of opinion, that, when the Engliſh uſe beech in their ſtoves, their herrings are leſs brown than when they burn oak; and we are not to imagine, that they heat their ſtoves with pit-coal. It is certain, that the Yarmouth herrings are of a ſuperior quality, and that they are cured very ſoon after being taken, which

which is a conſiderable advantage. But, as there is no police to regulate the package of them, as there is in Holland, and in ſeveral ports of France, bad herrings are often found in the Yarmouth barrels intermixed with the good ones.

Of ſome imperfections peculiar to Red Herrings.

Such herrings, as have ſtuck together when drying, loſe their ſkin in the ſeparating of them, and are therefore unmerchantable. Thoſe, that have got too much fire, or, what is worſe, are burnt, are likewiſe ſet apart with the refuſe.

Although it is allowed to cure herrings of three nights taking, yet it would be proper to put thoſe of one, two, and three nights in ſeparate barrels, as the herrings of one night are infinitely better than the others, and thoſe of three nights are of a very inferior quality. As to the herrings of four nights, it is not allowed to ſell them at all. There ſhould be alſo a prohibition againſt ſalting with old brine, of any ſort whatſoever, thoſe herrings, that are to be cured in this manner.

Of a ſort of half-cured Herrings, called Bouffis, *(ſwelled,)* Craquelots, *or* Appetits.

Theſe herrings do not keep long, and are uſually made of ſhotten herrings, and of thoſe of ſeveral nights, which are not fit to be cured in the

white, nor even in the red manner. As they are ready ſooner than the red herrings, they find purchaſers, and would be very delicate, if they were made of good herrings, and attention paid to the curing of them. They are called *Bouffis* (ſwelled), becauſe the ſmart fire they are put to ſwells them.

It is not allowed to ſalt the herrings, that are to be cured as red herrings, in the brine of the white ones; but, on the contrary, it is uſual to make uſe of this brine for ſalting the herrings we are now treating of. For they ſay, that new ſalt would make them crack, which indeed is not probable. Be this as it may, this method of curing herrirgs is entirely left to the women.

According as the women receive the herrings, they put them into large tubs, containing a quantity of brine, without preſſing them againſt one another. Many of them are ſalted enough in the courſe of twenty-four hours; but the ſhotten herrings as they diſcharge more blood than the full ones, are left in the brine for ſeveral days, and there is no danger of their taking too much ſalt. When they are taken out of the tubs, they are filed upon ſwitches, or rods, and then hung up in ſmall ſtoves, that may contain five or ſix thouſand herrings. It is not uſual to let them drip; but, as ſoon as the laſt rows are placed, the fire is lighted. However, at firſt they put up only one half of them, and keep the fire going for ſix hours, after which

which they put up the other half, and a clear fire is continued for nine hours more. The ſtoves are heated with *alder* alone, dry pieces of which are uſed for the firſt fifteen hours, after which the herrings ſwell, as they had not diſcharged their water. After fifteen or ſixteen hours, the fire made of *dry wood* is ſtopped; and for the purpoſe of giving the herrings a gold colour, the fire is then made of pieces of *green wood*, which are kept burning, ſo as to emit a great deal of ſmoke, and no flame. This fire is made merely to give the herrings a colour; for they have been dried already by the action of the ſmart fire. When the ſecond fire has ceaſed, the herrings are left to cool in the ſtove for about an hour, and are then taken down.

If there happens to be a great demand for herrings, cured in this manner, they ſometimes put freſh herrings, that have got no ſalt at all, in the ſtoves. They are very nice to the taſte, immediately after they are taken down, but do not keep; and accordingly this practiſe ſhould not be allowed.

Herrings of one night, when prepared, and properly cured in the manner already deſcribed, are very delicate; but as they muſt ſwim in *brine*, a great quantity of it is requiſite for a laſt of herrings.

Of

Of ſmoked Herrings, according to the Meclenburgh method.

It is ſaid, that, as ſoon as the herrings are taken, they are put in brine for a ſhort time, and then filed upon rods, and hung up in a ſort of tower, made of brick or wood, which is open at the top. A fire is made below of wood covered with *moſs*, and, when a great quantity of ſmoke is produced, the top of the tower is covered with mats. The herrings are left there, until they are ſuppoſed to be ſufficiently dry, and then taken down, and ſold immediately. They ſay theſe herrings are excellent, but they do not keep long.

Of the manner of curing Herrings, that are to be uſed as baits.

About the end of the ſeaſon, when the herrings are bad, the fiſhermen cure ſome of them, for the purpoſe of baiting their hooks. Some fiſhermen ſalt them firſt in *caſk*, that is, they give them a half-ſalting; but others cut off the heads, and open them, from one end to the other, on the ſide of the belly, and take out the inteſtine, as likewiſe, the milt and pey, if there be any. They alſo ſcrape the inſide of the herrings with a knife, and, when they have taken out the blood as much as poſſible, they throw them into a tub full of

of freſh water, in which they waſh them, rubbing them with their fingers, particularly near the long bone. From that tub they remove them into another, containing clean water, in which they waſh them again. When they are well waſhed, they are put into baſkets, and left to drip until the next day. About an hundred of them are then put into a baſket, in which, while two women ſhake them, another ſcatters ſome ſalt upon them, until every part of them is ſalted; after which they are poured into a tub, in the bottom whereof is a layer of ſalt. When the tub is filled up to within about four inches of the brim, it is covered. The herrings will keep in this manner for baits, but are not fit to be eaten.

FROM THE TRANSACTIONS OF THE HIGHLAND SOCIETY OF SCOTLAND. VOL. I.

In the curing of herrings, it is a matter of the utmoſt conſequence to attend to their condition, during and after the firſt ſalting. If they be allowed to lie in the firſt pickle long, eſpecially in barrels, expoſed to the ſun in hot weather, they are very apt to ſpoil, at leaſt that portion of them, which is neareſt to the warm ſide of the barrels. Now, a ſpoiled herring, is not only itſelf incapable of being cured, but it ſpreads corruption to the

the others packed around it: and thus the evil ſpreads. If the weather be rainy, and the fiſh-barrels be left uncovered; or, if the weather be warm; or, if the herrings before ſalting have been long in a ſituation unfavourable for their keeping ſound; or if they have acquired from any cauſe, as from the garbage not being well removed, &c. &c. a tendency to ſpoil; they ought to be examined carefully and repeatedly, ſhould be ſoon changed, and, on being re-ſalted and packed, ſhould have every unſound or ſuſpected one thrown out. The time, therefore, which they may be allowed to lie in the firſt pickle, muſt depend entirely on circumſtances. Perhaps, the firſt pickling may be done in troughs, or large tubs, with more eaſe, expedition, cheapneſs, and ſafety, than in barrels, in the common way. The Dutch, it is ſaid, frequently uſe troughs, for this purpoſe, filling them well up with fiſh, which touch and get the full effect of the preſſure of the lids or covers. Theſe are even made to preſs the fiſh more firmly, by means of weights, ſcrews, wedges, levers, or other mathematical powers.

OF

COD AND SALMON FISHING,

TRANSLATED FROM

M. DUHAMEL's TRAITE' GENERAL DES PESCHES.

Of Cod-fiſh in general.

UNDER the name of Cod-fiſh, are omptized ſeveral ſorts of fiſhes, which naturaliſts refer to one family, under the general denomination of *Aſellus*, *Gadus*, *Morhua*, or *Molua*. That fiſh, which in Holland, and on the Flemiſh coaſt, is called *Cabillaud*, by the Baſques *Bacaillau*, in the interior of France *Morue*, and on ſome coaſts *Molue*, is all of one and the ſame kind. According to the places, where this fiſh is taken, it receives different appellations. Thus the Greenland cod, is called *Aſellus Greenlandicus*, that of Newfoundland *Aſellus Oceani Septentrionalis*, &c.

The generical marks of Cod-fiſh.

All fiſhes of this family muſt be round and ſcaly. They have bones, ſeveral fins on the back

and belly, and behind the anus, of which almoſt all the rays are pliable, beſides two fins, one behind each gill, and two more under the neck or breaſt. Some of them have a kind of beard at the lower jaw, others not.

Of the common Cod-fiſh.

Cod-fiſh comes originally from the North, and ſpreads itſelf into a great part of the ocean. When the weather is very cold, they retire into deep bottoms, but, as ſoon as it becomes milder, they appear on the banks near the coaſts, and in gulfs. They come, however, ſooner or later to certain places, according as there are banks, or ſhoals of ſuch fiſh, as they feed upon.

Fiſhing for Cod-fiſh on the coaſts of France.

Although cod-fiſh is not very common on the French coaſts, yet ſome of them are taken there either in wiers, or with lines and hooks, or in nets, laid out for taking other ſorts of fiſh. Large cod is ſeldom taken by theſe modes of fiſhing; but in the Channel they frequently take young ones, that are not bigger than whitings.

Large cod-fiſh is taken more commonly at the opening of the Channel, or at the entrance of the German ſea. For this purpoſe, they throw out, on the bottom of the ſea, large lines furniſhed with

with hooks. This cod-fiſh is conſumed freſh, in the towns near the ſea, and in cool weather ſome of them are carried far in land.

Fiſhing for the Cod-fiſh called Cod of the Meuſe.

The cod, known by the name of *Cod of the Meuſe*, is of the large kind; ſome of them weigh 20lb. It is more delicate and more eſteemed than that of the Great Bank, or of Iceland, and accordingly ſells at a higher price. Part of it is conſumed freſh; the Dutch ſalt the remainder, as we ſhall explain hereafter. As this cod can be eaten ſoon after being corned, this circumſtance contributes much to the eſtimation it is held in.

Fiſhing on the coaſts of Scotland.

In ſummer, the Scotch fiſh for cod along their coaſts with hooks in ſmall ſloops, and return every evening to land; but they have more conſiderable fiſheries on the reefs and banks to the North of Scotland; the greateſt part of the cod they take is conſumed freſh.

When the fiſhermen go out to the diſtance of twelve or fifteen leagues, and become apprehenſive that the fiſh may be ſpoiled, they give it a half-corning, which makes it firm, and gives it a more pleaſing reliſh, than if eaten freſh.

About

About the middle of June, they give up this fiſhery, and proceed ſtill more to the North, either to fiſh there, or to procure ſuch fiſh, as the natives of the more northern countries have already taken and prepared; and at their return, they ſettle themſelves upon Dogger's bank.

The people of Dieppe have frequently ſent large boats with eighteen or twenty men, to fiſh for cod on the coaſts of Scotland. They always quit thoſe coaſts about the 20th of Auguſt to return home, take in proviſions, and then ſet out for the herring fiſhery at Yarmouth.

Fiſhing for Cod in Ireland.

The part of Ireland moſt abundant in cod is the Weſt, about the Bay of Dingle; the fiſhery continues from Michaelmas until May. It is ſaid, that they fiſh for cod in the mouth of the Suir, from June to November.

Fiſhing for Cod on Dogger's Bank.

They fiſh for cod on ſeveral banks and reefs in the German ſea. Dogger's bank, is probably ſo called, from there being ſometimes found there, a prodigious number of ſea-dogs, which come in ſkuls or ſhoals, like other fiſh of paſſage.

As the fiſhermen of all nations are allowed to fiſh in open ſea, provided they remain in their own veſſels

veſſels, they are accordingly authorized to fiſh on Dogger's bank; but, as it is near Holland, the Dutch reſort to it more than any other nation. They have veſſels, of from 60 to 80 tuns, beſides ſmaller, that make two or three voyages a year for this purpoſe. Some of them continue fiſhing there for five or ſix months without interruption, in which caſe they ſend the ſmall veſſels with the fiſh, to different ports of Holland. Others quit this fiſhery in September, to go in purſuit of herrings at Yarmouth, and afterwards return to Dogger's bank; never returning home, but when they are forced by bad weather, or by want of proviſions, or when they have made up their cargoes.

Although this bank is about fifty leagues from the coaſt of Holland, yet they bring live cod-fiſh over, by means of well-boats; ſome of which contain one thouſand cods; but care muſt be taken, that the fiſh has not been too much hurt by the large hooks, that they uſe in this fiſhery. However, it is well known, that having carefully taken out a hook, that had dragged the ſtomach out of the mouth, and having replaced the ſtomach in the fiſh, by means of the end of a ſtiff rope, the cod did not die in the boat; but they ſay, that in this operation the ſtomach becomes full of air, which would kill the fiſh, if vent were not given it, by piercing the ſtomach with a ſmall pointed knife under the gill; and, when the air has been let out, they put the fiſh in the boat along with the reſt.

Some

Some imagine, that the cod-fiſh grows fat in theſe boats, wherein they get nouriſhment; but this is not the general opinion, and the men are well pleaſed, if they can bring them to their deſtination alive; for it happens ſometimes, that many of them die, on the paſſage, when the weather is bad.

The cod-fiſh of Dogger's bank is the ſame, as that of the great Bank of Newfoundland. It is more white when ſalted, which is owing to the manner of preparing it, as ſhall be ſhewn hereafter. It has always the advantage of being very freſh, newly ſalted, and much better than that of Newfoundland.

There are ſome places on Dogger's bank only twelve or fourteen fathoms deep, which renders the fiſhing there very convenient; there is but a ſmall quantity of fiſh to be found in ſuch places, as cod-fiſh likes deep water of ſixty or eighty fathoms.

They cure green cod (i. e. ſalted but not dried) on this bank, which we ſhall ſpeak of, when treating of the fiſheries on the great Bank of Newfoundland.

Of bottoms, or grounds, and certain circumſtances favourable for fiſhing.

The ſeamen call good bottoms, thoſe, where there are rotten rocks, or ſhells, as likewiſe where there

there is a fat ſoil. Red bottoms uſually abound in ſhell-fiſh. As cod-fiſh finds nouriſhment in ſuch places, great quantities aſſemble there, as alſo upon grey bottoms, where there is plenty of horn-fiſh.

It is ſuppoſed, that certain marine productions, eaten by cod, make them flabby; it is ſaid, that floating weeds and muddy ſubſtances are of this kind. Bottoms of fine ſand, and of hard unbroken rocks, are looked upon as bad, becauſe the cod is poor there, and it is ſaid, that in ſuch places there are zoophytes, which communicate a bad quality to the fiſh.

The moſt favourable weather for this fiſhery, and for every ſort of fiſhing with hooks, is, when the ſky is covered, and the ſea ſmooth. High winds and a troubled ſea are bad, on account of the toſſing of the veſſel; the leads are dragged from the bottom, and the lines are entangled.

Baits for Cod-fiſh.

The choice of baits is a matter of very great importance. Cod-fiſh is exceedingly voracious, eſpecially that of the great Bank, owing, perhaps, to the enormous quantity of them, that come there. When hungry, they ſwallow up every thing, that falls into the ſea. There have been found in their ſtomachs knives, ſtones, &c. and, although gorged with fiſh, they ſometimes dart at hooks, which are not baited. On the firſt arrival of the ſhips, it is often

often ſufficient to ſhew them a *lure*, which conſiſts of a piece of tin or lead, coarſely made in the form of a fiſh, but which muſt be of a ſhining colour. The *lure* is ſometimes no more than a ſcrap of cloth of ſome bright colour; but it often happens, that they will not bite at ſuch baits, on which account the fiſhermen offer them baits of ſalt-meat, or lard, or of ſalt mackrels, or herrings. But as ſoon as they take any cod, they uſe their hearts, or bloody jaws, or even the entrails, for baits. They ſometimes apply the heads and even the fleſh of ſome ſmall cod to this purpoſe, but never the liver, which they lay a part, to make oil of.

Although cod-fiſh devour one another, there are however, other kinds of fiſh, that they are much fonder of, ſuch as mackrels, herrings, pilchards, and all ſorts of ſhell fiſh; but as the moſt part of baits of this kind are ſcarce, the fiſhers ſometimes uſe, after having baited the hook with the offals of cod-fiſh, to add a little bit of them, at the point of the hook.

Whenever they have delicate baits of that kind, the cod ruſh on in ſuch numbers, that the veſſels, which have no other baits but the offals of cod-fiſh, are obliged to take another poſition diſtant from that, where the good baits are uſed. When they find any fiſh in the cod's ſtomach, that is not digeſted, they make uſe of it for baits, and they are almoſt certain that it will turn out well.

On

On this account the fiſhermen open the cod's belly, to take out whatever fiſh may be in its ſtomach.

As there are found in the ſtomach of cods ſeveral ſorts of fiſh, ſuch as cruſtaceous fiſh, crabs, lobſters, ſhrimps, we may conclude, that ſuch kinds of fiſh are good baits.

The fiſhermen of Picardy and Flanders collect a great quantity of frogs, with which they take cod, not far from their ports. They hook them acroſs the legs, and, as they live a long time in water, they allure the fiſh the better.

On the ſame coaſts, as about Boulogne, they take ſmall cod-fiſh with hooks baited with ſand-worms, or with herrings and mackerels, both freſh and ſalt.

The Baſques find anchovies and pilchards very good baits.

The fiſhermen of Iceland and Ireland, make uſe of muſcles, when herrings are wanting; and in the ſame caſe the Dutch bait their hooks with very ſmall freſh-water lampreys, which they keep alive in reſervoirs.

We read in the Natural Hiſtory of Iceland (Tom. 1. page 167) that the inhabitants look upon the fleſh of an animal, which has been juſt killed, as an excellent bait, and eſpecially the hearts of ſome birds. They ſay, that with ſuch a bait, twenty fiſhes can be taken, ſooner than one, with any other bait. It is alſo ſaid, that there are ſome

ſpecies of fiſh, of thegenus of *cuttle-fiſh*, that make good baits.

The Engliſh fiſh for herrings early in the ſeaſon, on the coaſts of Newfoundland. But, as herrings become ſcarce there about the middle of June, they pick up afterwards a variety of whatever ſmall fiſh they can get for baits.

As it is not poſſible to have this bait-fiſh freſh at all times, it is uſual to keep ſome of them corned, nor does the cod-fiſh reject them, particularly if care be taken to freſhen them, before they are put to the hooks.

Of the preparation of Green Cod, *that is, Cod ſalted, but not dried.*

Cod-fiſh is prepared ſometimes in the round way, and ſometimes in the flat way, according to the Dutch method; it is alſo ſalted either in bulk, or, in caſks and barrels. To diſtinguiſh theſe methods from one another, we ſhall call the cod, cured in the round and bulk manner, cod prepared according to the *French* method, and that, which is prepared flat and in barrels, cod prepared according to the *Dutch* method.

Of certain commodities, drawn from Cod-fiſh.

When the fiſhers intend to make *rave, rogue*, or *roe*, for the pilchard fiſhing, they lay aſide the peys

or

orroes to ſalt them. The roe is a bundle of eggs, wrapt up in a membrane or ſkin; ſome of them weigh one or two pounds, according to the ſize of the cod; they are ſalted apart in barrels. This roe is an excellent bait for pilchards; the Baſques ſell it to the Spaniards of the coaſt of Biſcay, at the rate of from ſixty to one hundred and twenty livres per caſk, of about five cwt. The heart and ſpleen are ſometimes kept for baits; but the livers are always reſerved for the purpoſe of making oil. The reſt of the entrails are thrown away, except the air-bladders, or ſwims, which are laid by, and ſalted apart, together with the tongues, and ſuch parts of the heads, as have not been conſumed by the men.

Of the air-bladders, vulgarly called Swims, or zounds.

This ſort of ſubſtance is found in ſeveral kinds of fiſh, particularly in the ſhaid, which is taken near Vienna, in ſturgeons, &c. and 'tis of this they make the fine iſinglaſs in Ruſſia. On the banks of Newfoundland glue, alſo has been made of theſe ſwims, or zounds; it is not as fine as what we get from Ruſſia, but ſtill it is very good. Take off the ligaments about the ſwim, paſs a ſtring through it, and then dry it. This ſort of glue is dear, and the cod-fiſhers would probably find more ad-

vantage in getting glue made of the ſwims, than in ſalting them for ſale, in Europe; for, when ſalted, they are not fit to make glue of. To make uſe of this glue, it muſt be broke in ſmall pieces, then ſteeped for ſome days in water, and afterwards boiled. The ſwims of the largeſt fiſh only, are preſerved.

Remarks on the French manner of preparing green Cod.

As far as the cod is opened, the large bone is taken out, but they dont open it further than from the neck to the *anus*, or, as it is improperly called, the *navel*. This is owing to the cuſtom the French have of ſalting Newfoundland cod, ſo as that it may remain of a roundiſh form towards the tail, on which account it is called *round cod*.

On the contrary, the Engliſh take out the whole bone, and ſplit open the cod in its full length, and ſo prepare it flat. The Dutch prepare it in the ſame manner, and barrel it up. The dry cod is alſo prepared ſometimes round and ſometimes flat, but of this we ſhall treat in the ſequel.

The manner of ſalting Cod, in bulk, according to the French method.

To give cod a firſt ſalting, take care to put as much ſalt as poſſible in its body, then rub the whole

whole ſkin with ſalt, and lay them in a particular part of the middle deck, or of the hold, in ſuch a manner, that their tails ſlope downwards; cover them with a bed of ſalt, and lay others over them and along ſide of the firſt. Let them remain thus piled together, ſo that the water and blood may run off, for twenty-four or forty-eight hours, according as time will allow.

When the blood and water are ſufficiently diſcharged, give the fiſh a full ſalting, for which purpoſe they are to be removed from the place they were in, and ranged in piles, in the middle deck, or in the hold. To form theſe piles, or layers, make a floor of pieces of wood, or of dry branches of trees, covered with matts, on which lay a bed of ſalt. The firſt layer conſiſts of the offals, which generally belong to the crew. Then place the cod-fiſh in rows, and between each layer throw a bed of ſalt, ſo as to prevent their touching one another; however, there muſt not be too much ſalt, as it would injure the fiſh.

A great deal depends upon the ſkill and attention of the ſalters. The Normans and Bretons engage ſkilful men for this employment, at a good ſalary, but ſome entruſt the ſhip-boys with it. In large veſſels, two men are employed, one of whom attends to the firſt ſalting, and the other, to the full one; but in ſmall veſſels, one man does both; ſome of them place the large cod in the firſt rows, then the middling ones, and the ſmall ones on

on the top; but the moſt of them neglect this precaution, which is very troubleſome, and of no great uſe. The tongues, heads, and zounds, are ſalted, and placed under the cod, as already obſerved. But after the cod has been taken out at the landing place, they raiſe the tongues, and zounds in baſkets, and ſhake them in a kind of ſieve, ſo as to throw off the overplus of ſalt. They are then put in barrels, wherein they keep a long time without being ſpoiled.

When the tongues are to be dreſſed for table, they muſt be firſt ſteeped in water, to make them tender and freſh; but as to the zounds, it is ſufficient to waſh them.

The Engliſh fiſhers, on the Bank, give the cod, whether large or ſmall, only a half-ſalting, and ſend them in ſmall veſſels to ſhore, where, after having waſhed and ſteeped them for a ſhort time, they let them dry a little, and then give them a full ſalting, if they intend to make dry cod.

Remarks on the good quality of Green Cod.

Beſides the attention neceſſary in ſalting cod, the good quality of it depends upon ſeveral other circumſtances. 1. Cod, like all other fiſh, is flabby and bad, in the time of ſpawning. 2. Nothing can be ſalted as well in hot, as in cool weather. 3. The fiſhermen ſay, that in certain ſeaſons, the cod feed upon mire, or weeds, that float

float on the water, and which make them of a bad quality; and that, the beſt ſeaſons for ſalting are, ſpring and autumn. 4. In winter, beſides the danger of being ſurrounded with ice, there is only ſmall cod to be found. 5. The choice of ſalt is alſo an important conſideration. 'Tis generally imagined, that old French ſalt, that has loſt its ſharpneſs and bitterneſs, is preferable to white ſalt, and that it gives the cod a delicacy, which is more to be valued, than the whiteneſs cauſed by other ſorts of ſalt.

Of Salt brought back after the Fiſhing ſeaſon.

Salt is often brought back from the bank of Newfoundland. It is diſtinguiſhed into two ſorts; the one is called *new* ſalt, the other *old* ſalt.

New ſalt is that, which had been carried out, and not been made uſe of. The fiſhermen ſay, that this ſalt contracts a bad quality, and that its ſtrength is weakened by having been kept at ſea, and they aſſert, that ſeveral perſons have loſt their cargoes on account of their having uſed this ſort of ſalt, and that, at leaſt, it makes the cod red, which the purchaſers dont like.

It is probable, that the cauſe of ſome cargoes being ſpoiled, was not the uſe of this ſalt, but, that the fiſh had been taken and ſalted in a bad ſeaſon. When trade was carried on with the North, this ſalt uſed to ſell as high as the other, and

and it is uſed at preſent with good ſucceſs for ſalting herrings.

It appears, alſo, that this ſort of ſalt could be improved, by expoſing it to the air and ſun, or by putting it under ſheds. As ſalt, which has been kept in the holds of veſſels, imbibes a great deal of moiſture, it has leſs ſtrength than dry ſalt. Beſides, dry ſalt, by attracting the moiſture of the fiſh, contributes more to its preſervation, than damp ſalt can do. By the name of *old* ſalt, they underſtand ſalt, which has been made uſe of in ſalting cod, and which remains after unloading the cargoes. It is fit only for ſalting hides, yet, ſome people make uſe of it for other purpoſes, by mixing it with new ſalt, and ſometimes they barter it for new ſalt, giving three barrels for one.

Of the Oil of Cod-fiſh.

The *Icelanders* collect the cod's livers with great care, and put them in caſks, wherein they ferment and melt, for about ſix weeks, after which, they take out the oil. They often mix it with whale oil, without boiling; but afterwards, they boil the groſs part, and extract from it an inferior ſort of oil, which they mix with other oils of the ſame ſort, and call it *thran brun*. The whole of it is ſold to Daniſh merchants.

Of

Of the preſervation and diſpoſal of Green Cod, &c.

Cod, to be good, muſt be entire, the ſkin on, be white, firm, not ſpotted, and not have a bad ſmell. It muſt be kept in cool, but not damp, ſtore-houſes. It keeps very well until ſpring, but heat ſpoils it. They have, however, very good cod the whole year round in the northern provinces of France; but it cannot bear the heat of the South, much leſs that of the Levant. Therefore, green cod muſt be conſumed in France, and as it is much eſteemed, it often happens, that there is not a ſufficiency of it, and that they are obliged to have recourſe to foreigners for a further ſupply.

In July and Auguſt, the French are ſupplied with excellent cod, cured in the north of Ireland, and Scotland, on Dogger's-bank, in the German ſea, &c.

Of the preparation of Green Cod, according to the Dutch method.

Although the greateſt part of the French fiſhers prepare cod-fiſh in the round manner, as before deſcribed, there are ſome of them, however, who cut it flat, and ſalt it in caſks and barrels, which we have called the *Dutch* method.

When

When they take a cod, they do not immediately take out the tongue; nor do they open it to take out the ſtomach. They throw it behind them on the deck, and men, whoſe buſineſs it is to prepare it, take off the head, and hang up the fiſh, with its tail downwards, by a hook, to a ſtake fixed for that purpoſe in the back part of the veſſel. The tongue is the only part of the head, that they reſerve for ſale. Having taken off the head, and let the blood flow out, they open the fiſh as far as the *anus*, or navel, and take out the entrails for bait. They alſo open the ſtomach, to get whatever may be in it fit forbait. The crew ſometimes dreſs what they call cod's tripes, which are nothing elſe but the ſtomach, which they waſh and beat, as if waſhing linen. They hang it up for a couple of days, and then waſh it again, and boil it; it is but indifferent food.

The livers are carefully reſerved, for the ſake of the oil; and as to the ſwims, or zounds, they take out only thoſe of the large fiſh.

They ſplit the fiſh in its whole length, and take out all the large bone, except a ſmall part of it towards the tail, and clip the ends of the fins. A boy then waſhes it in a tub full of ſea-water, until all the blood is got out: when waſhed, 'tis left to drip in a baſket.

Before the fiſh have quite done dripping, they are packed in barrels, and a little ſalt is thrown upon them. Care is taken to put more ſalt in their

their bellies than elſewhere. They are left for two days in this ſtate, after which they are poured into tubs, and waſhed in their brine. Then they are let drip again, and packed anew, in the barrels, in ſuch a manner, that a bed of ſalt, and a bed of fiſh, are placed alternately. They are preſſed very cloſe together, and, when thus made up, are in a ſtate to be ſent to France, or elſewhere, where they are to undergo ſome new preparations as we ſhall explain.

Of the barreling of Cod-fiſh, as it is practiſed at Treport, in France.

When the veſſels arrive, they ſet apart ſuch barrels of fiſh, as have loſt their brine, and want to be ſalted again. However, the whole cargo is lodged in ſtore-houſes, where it remains, until the barrels are to be re-packed. Beſides large ſtore-houſes, and a place for keeping ſalt, there muſt be a ſpacious ſhed, provided with large tubs, two feet four inches high, and ſix or ſeven feet in diameter, ſo that ſix or ſeven women can waſh fiſh in them at the ſame time. There muſt be alſo ſome benches to let the fiſh drip, as will be explained hereafter, and a preſs for the purpoſe of preſſing the cod cloſe together, in the barrels.

The fiſh having been ſalted and barreled twice at ſea, are now to be barreled and ſalted a third time, ſo as to prepare them for ſale, and to make keep

keep good for a long time. The greateſt part of this operation, which they call *dry* ſalting, is left to the women.

Into one of the large tubs, 45 or 46 barrels of cod are emptied together with their brine; when there is not brine enough in the barrels, they make new, with ſalt diſſolved in water; for there muſt be brine enough to cover the fiſh.

The women, that are around the large tub, waſh the cod, fiſh by fiſh. This is done by holding them with the left hand againſt the ſide of the tub, ſo as to keep them dipped in the brine, and by rubbing them with a ſmall broom, in the right hand, taking care not to injure the ſkin; having repeated this operation, three or four times, they put thoſe, that are waſhed, in heaps, in the ſame large tub, which contains the brine.

Then they take out the fiſh, that have been thus waſhed, and holding them by the tail, dip them four or five times in the veſſel full of freſh water. When this water becomes ſalt, they pour it out and renew the water.

After about a barrel and a half of cod has been thus waſhed in the brine, and twice in freſh water, a woman takes them one by one, and examines them. With a knife ſhe takes off all the blood, that may have remained on them, and every thing elſe, that might injure the fiſh, as to its quality and whiteneſs. She waſhes them again, if neceſſary, and then the cod is in a condition to be left to drip

drip on the benches or frames. Theſe benches are made of ſtrong ſhingles, laid upon thick planks, that ſerve for ſtocks. A little opening is left between the ſhingles, for the flowing off of the water, that drops from the fiſh.

The floor under the ſhed is paved and ſloping, ſo as that all the water, that falls, may flow off into a channel.

If the ſhingles, laid over the benches, touch the wall, that part is lined with planks, to prevent the gravel from falling upon the fiſh.

As to the manner of arranging the fiſh, they double up ſome of them, leaving the fleſhy part inſide, and the ſkin outſide. Theſe are placed longways, at the back part of the edifice, to ſerve as pillows for the others, which are laid croſſways on the boards. The fiſh, that are thus laid croſsways, and that form the pile, are ſo placed, that towards the head they are elevated on the pillows, while the tails incline downwards, forming an angle of about forty-five degrees. They form a pile, by laying divers beds of fiſh, one over the other, with this precaution, however, that in the firſt bed, which lies immediately on the ſhingles, the ſkin is undermoſt, and the fleſhy part uppermoſt, whereas, in all the other beds, the fleſhy part is placed undermoſt, and the ſkin uppermoſt, to prevent the air's acting upon the fleſh, which would make it yellow.

In

In this manner, beds of cod are arranged, ſo as to form a pile of thirty, forty, or fifty barrels, in ſhort, of as many as can be got ready in one day; and on the next day, the ſame operation is recommenced.

'It is eaſy to conceive, that the fiſh, which is in the lower part of the piles, is, as it were, under a preſs, and that it drips better than that, which is in the upper part; on this account, after three or four days the piles are changed, ſo as to place undermoſt, what was uppermoſt before. It is of great conſequence to keep the fiſh from the ſunſhine, even when it is in barrel, on which account all theſe operations are carried on under a ſhed.

Eight days after, when the cod has dripped enough, it is put into barrels, that have ſeveral holes near the rim, for the purpoſe of letting out the brine, formed by the ſalt that is put into them; but, before this is done, the fiſh is weighed: for, in France, every barrel muſt contain 260lb. of fiſh, (ſixteen ounces to the pound) and forty lb. of white ſalt.

When weighing the fiſh, they ſort them; ſuch as are ſmall, poor, red, or ſpoiled, are laid aſide; they keep, however, thoſe that are not very ſmall, as it is uſual to ſell this ſort of fiſh by the pound. It is afterwards carried under the ſhed to be barreled, which is done in the following manner.

The

The women, whoſe buſineſs it is to barrel the cod, begin the operation by putting a couple of handfuls of ſalt in the bottom of the barrel, and then a little ſalt on the fleſhy part of the fiſh. They turn up the gills, and adapt the fiſh to the interior form of the barrel. Two pieces of cod, form nearly a bed; they cover it with a little ſalt, and continue to make up ſuch beds of fiſh and ſalt, alternately.

When the barrel is half full, the cooper puts a falſe bottom on the fiſh, and jumps upon it. Having preſſed them well, he takes off the falſe bottom, and the women continue to fill up the barrel. It happens very often, that they are obliged to pile up the fiſh, to make the proper weight, higher than the brim of the barrel, in which caſe, they make uſe of a ſort of preſs, which acts upon a falſe bottom, until the fiſh is preſſed down to the proper level. The falſe bottom is then taken off; the women throw what remains of the forty lb. of ſalt on the pile; and the cooper cloſes up the barrel.

The whole operation terminates with piercing eight holes between the firſt and ſecond hoop. Through theſe holes they run ſome packthread, which is faſtened, with a leaden mark, ſtamped with a ſeal. This is done by a perſon named, the Commiſſary of the Salt Ferme, or at leaſt, in his preſence, to ſhew that the barrel has been properly made up, and that the due quantity of ſalt has been uſed.

Of

take them out, they waſh them in tubs, and then place them on ſloping boards, with their tails againſt one another. Having thus left them to drip for ſeveral days, they make them up in caſks, or barrels, and throw ſome white ſalt upon them, after which they make ſeveral holes in the bottoms of the barrels to let out the brine, formed by the moiſture of the fiſh, and then ſtop up the barrels.

The fiſhermen of Grandville, who fiſh on the great bank, to accommodate their friends, make choice of ſmall cod of two or three lb. weight, which are more delicate than the large ones, and put them in barrels, throwing ſome ſalt upon them, without cutting them in pieces. As they are kept from the contact of the air, they remain freſh for a long time. The Grandville fiſhermen never prepare cod in brine. Small cod is uſually neglected, as unfit for commerce; but it appears, that, if they were prepared in this manner, they would bear a preference, on account of their delicacy.

Of the Police of Dunkirk, with regard to barreling.

The magiſtrates of Dunkirk have eſtabliſhed the following regulations:

1. The barrels muſt be made of good oak, and there muſt be at leaſt twelve ſtaves to each barrel. They muſt contain one hundred and thirty pints, Paris meaſure, and the firſt letter of the maſter cooper's

cooper's name is to be marked upon them with a red hot iron. They are then to be inſpected by the warden of the coopers, who puts the mark of the city upon them, and is allowed ſix deniers for every barrel.

2. The empty barrels muſt weigh about thirty, or thirty-one lb. (ſixteen ounces to the lb.) and, when the cod is put into them, in the moiſt or brine way, they muſt not contain leſs than three hundred and twelve lb. of fiſh.

3. For preparing fiſh in this manner, it requires from forty to fifty lb. of white ſalt, in brine, ſo that the groſs weight of the barrel is to be about three hundred and eighty-eight lb.

4. The barrels for cod, in dry ſalt, muſt weigh, when empty, thirty, or thirty-one lb. like the others.

5. They muſt contain three hundred lb. of fiſh, from which the old brine has run off, and thirty-ſeven, or thirty-eight lb. of ſalt, ſo that the groſs weight of a barrel of cod, in dry ſalt, muſt be about three hundred and ſixty lb.

6. The men, who make up the barrels, muſt ſeparate the cod, fit for ſale, from ſuch as are ſmall poor, black, yellow, or otherwiſe injured, which are to be put into other barrels, marked with the word REBUT, that is, *refuſe*, or, *traſh*.

7. Theſe men muſt be ſworn. The number of them is fixed at thirty, and their ſalary at five ſous per barrel, whether the barreling be in brine, or

in dry ſalt. They dont form a corporation, and every trader can employ whichſoever of them he pleaſes.

8. To prevent any trader from eluding the execution of theſe orders, he muſt mark the barrel of his own ſalting, with the firſt letter of his name.

N. B. Theſe regulations refer merely to the laſt barreling and ſalting, which takes place after the ſhips arrive in port, and have nothing to do with any prior preparations.

Of the relative goodneſs of green Cod, prepared according to the methods deſcribed.

The green cod of Newfoundland, prepared as before, is much eſteemed in France, when it is new; but, according as it grows old, it loſes its value, ſo that towards the middle of Lent, when the warm weather begins to ſet in, it is looked upon as a very common kind of fiſh. The preference is then given to barreled cod, that has been prepared according to what we have called the Dutch method.

Some people always prefer barreled cod, becauſe it is whiter; but as the whiteneſs only proceeds from the uſe of white ſalt, it makes the fiſh tough, and even changes the taſte of it. The chief reaſon why barreled cod ſells well, is, that it keeps better, and therefore, about the middle of Lent, it is preferred to the other, although, at firſt, it was not as delicate.

Cod

Cod, barreled in brine, is conſidered more delicate than that, which is barreled in dry ſalt: ſeveral perſons, however, prefer the ſecond ſort, becauſe, in dreſſing it for table, it ſwells, whereas the firſt ſort ſhrinks.

As ſmall cod, at leaſt that of a middling ſize, is more delicate than the overlarge kind, and as every one allows, that the old ſalt of *Brouage* is better for cod than white ſalt, the Dunkirk traders make choice of ſmall cod, and ſalt them in barrels, and in brine, with *Brouage* ſalt. Such ſmall cod keeps longer, is more delicate, and ſells at a higher price, than that made up in bluk.

Of the Cod, called L'ANDOLIUM.

In Flanders, they have a particular method of preparing ſome cod, which they take on their coaſts; it is ſaid to be preferable to freſh cod, as it has a little reliſh of ſalt, that makes it very pleaſing. It is called *Andolium*; they ſay it is prepared in this manner. The fiſh is put, alive, into a tin veſſel, and killed, by throwing a great deal of ſalt over it and under it. It keeps but for a fortnight at moſt; but, if dreſſed for table, in the manner of freſh cod, it is ſaid to be delicious.

Of the preparation of green Cod, in Northern countries, which is called ABERDEEN, *or* ABBERDAHN.

The author of the General Hiſtory of Iceland is of opinion, that this name of *Aberdeen*, *&c.* comes from the town of *Aberdeen*, in Scotland, where he ſuppoſes, that cod was firſt prepared in the manner we are going to deſcribe.

In northern countries, there are various methods of curing cod; ſome people cut off the head, and take out the large bone; others leave the head, and prepare it along with the reſt of the fiſh; but the general mode uſed in thoſe countries is, to dry the fiſh without ſalting it. However, they prepare a ſmall quantity in the green way, of which we ſhall now treat.

The method of making *Abberdahn*, or *Aberdeen*, is as follows. When the cod is brought into the fiſhing boats, they cut off the heads, and gut them as far as the *anus*, without ſplitting them into two pieces. They then carry them to land, and throw ſome of the country ſalt upon them; after which, they waſh them in ſea water, or in brine, and ſalt them anew in barrels, with Spaniſh, or Portugueſe ſalt. This cod is not near as good as that of Newfoundland, not only on account of the ſalt which they uſe, (of which hereafter) but likewiſe,

likewiſe, becauſe, in Norway, they cut the green cod badly, ſo that its fleſh is often red with blood. They give it a firſt ſalting, in large tubs, and having left it for eight days in this brine, they lay the fiſh in heaps, over one another, until the brine has dript of; it is then put into barrels with coarſe Portugueſe ſalt. This method might be very good, if they had the attention to waſh the fiſh, before it was barreled.

Norway produces a great deal of ſalt, but it is fit only for the firſt ſalting, which ſerves to make the fleſh firm, and to ſoak the blood. The laſt and real ſalting, which preſerves the fiſh, muſt be done with French, Spaniſh, or Portugueſe ſalt; the laſt is more commonly uſed by the Norwegians, on account of the trade they carry on with Spain and Portugal. The inhabitants of Denmark, Holſtein, and of the countries bordering on the Elbe, make uſe of white Hamburgh ſalt, although it is ſuppoſed to have little ſtrength.

The caſks, in which they put their cod, are of deal, and are of a much worſe make than the Dutch; and they often put bad cod, and even other ſorts of fiſh, in the middle of them, between the better ſort of fiſh, which is placed at both ends.

The Dutch, that fiſh for cod in the northern ſeas, prepare it better than the Norwegians. They cut off the heads, and open the cod as far as the *anus*; and, after a firſt ſalting, to make the fleſh firm

firm, they arrange it in barrels, with coarſe ſalt, one layer over another. Thus they make what is called *Abberdahn*, which is more eſteemed than that of the Norwegians, although both methods are nearly the ſame; but the Dutch *abberdahn* is prepared with more care and cleanlineſs, and with better ſalt.

Of fiſhing for Cod, near Iceland.

Several French traders go to Iceland, to fiſh for cod. We have obſerved already, that the traders of *Olonne*, who go to Newfoundland, ſet out as ſoon as poſſible, and that they often return to France, without having completed their cargo, on account of the great profit ariſing from the ſale of new cod. But ſhips cannot ſail ſo ſoon for Iceland, becauſe of the great dangers from the ice. They uſually ſet out from Normandy in the beginning of March, and return in September and October, or ſometimes ſooner. A veſſel of ſixty or ſeventy tun, can bring back one thouſand, or one thouſand two hundred barrels of cod.

On the bank of Newfoundland, the fiſhery is carried on at ſixty or eighty leagues from land, but at Iceland they fiſh in ſight of land. As cod is uſually larger far out at ſea, than it is near ſhore, the Newfoundland cod is generally larger than that of Iceland, but not ſo grey, or ſo much ſpotted. It is, however, the ſame fiſh, and the Iceland cod is of a very good quality.

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Such a veſſel, as we have mentioned, carries thirteen men, beſides ſome boys. They take out from one hundred and fifty, to one hundred and ſixty barrels of white Portugueſe ſalt, which has been refined at Etaples, near Boulogne, in Picardy.

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Of watering Cod for market.

In watering cod, ſalt water is preferable. If freſh water be uſed, it muſt be changed often, as, otherwiſe, the fiſh would contract a bad ſmell, on which account, running water is preferable to any other.

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have bit, the hooks frequently ſtick in various parts of the cod's bodies, ſome of which are drawn up, and others eſcape wounded. A much greater number is wounded than is drawn up, and many of thoſe, that are ſo wounded, either die, which is a loſs to the fiſhery, or, by their bleeding, frighten the other fiſh, which quit the place. This mode of fiſhing, therefore, ſhould not be allowed, except in ſome rare inſtances. The reaſon of its being called *grappling* is, that, in the boat, each man has too lines, which he throws out, and draws up, alternately, at each ſide of the boat, to right and left, as faſt as poſſible, ſo that the whole action and operation is ſomewhat ſimilar to that which is uſed in mowing, and is therefore called by the French, *faux*, or *ſcythe* fiſhing; we have named it *grappling*.

Of the Weather moſt favourable for fiſhing.

The beſt time to fiſh for cod, and for every ſort of hook fiſhing is, when there is a mizling rain, and a covered ſky, with a breeze from S. W. or S. S. W. Cod is not apt to take the bait, when the ſky is clear. Cloudy weather is more favourable.

How to make what they call Pine Cod.

To prepare cod in this manner, when the fiſh is more than half dry, it is laid out on the ſtrand in cloudy weather, with the fleſhy part uppermoſt. Having imbibed ſome moiſture, it is laid in heaps for ſome days, whereby it grows warm and tender, after which, it is expoſed to the ſunſhine, until it becomes quite dry. It acquires a ſort of ſmoaky colour, but it is more delicate than white cod, although the people of the *Levant* prefer the white kind.

As this preparation depends upon a light fermentation, it is plain, that cod, which has been heaped up, before it was well dried, becomes tender and delicate in the ſame manner; on which account, at the unloading of the cargoes, there is often found ſome pine cod, though it had not been prepared intentionally.

OF THE COD FISHERIES IN THE NORTH, AND OF VARIOUS METHODS OF CURING COD.

There is ſcarce any cod taken in the Mediterranean. There is ſome found on the weſtern coaſts of

of France, but it is more abundant in the German ſea, eſpecially at the North of Scotland and Ireland. There is, however, a much greater quantity of it in North America, as alſo in the North of Europe, at Iceland, Shetland, Greenland, Denmark, Norway, Ruſſia, &c.

Anderſon, in his natural hiſtory of Iceland, multiplies the different ſpecies of cod-fiſh too much. The Northern words *Dorſch* and *Torſk*, are generical denominations of all ſorts of fiſh of the genus of the *Aſellus*, *gadus*, or cod, which, however, does not prevent the application of theſe names, in a particular manner, to one ſpecies, rather than to another. Mr. Horrebows, who lived for ſeveral years in Iceland, aſſerts, that the *Torſk* of the northern fiſhers, is the ſame as the *Cabillaud* of the Dutch, (*Aſellus major vulgaris*) and that the *Torſchet*, or *Tiſling* of the Icelanders, is a diminutive of *Torſk*, that is, young *Torſk*, which is called *Bergen-fiſh*, in Denmark. He adds, that the *Torſk*, of a middle ſize, is called *Titthing*, in Iceland, and *Mittel-dorſch*, in Denmark. According to him, there are three ſorts of cod near Iceland; the firſt ſort, which they call *dorſch*, is the beſt, and is known in Denmark, under the name of *Kabliau*; the middle ſort is called in Iceland, *Stuttingen*, and the ſmall kind, *Tiſling*. Theſe three ſpecies are allowed to be *torſks* of different ages, and do not differ from each other, but in their ſize. He ſays alſo, that the *lingen*, or

ling

ling, which is called *lips*, by the Icelanders, and *oefs*, by the Norwegians, is the *aſellus longus*, which is likewiſe a ſpecies of *torſk*, but longer and leſs thick than the other kind.* We may, therefore, conclude, that, according to M. Horrebows, the *torſk*, or *cabillaud*, that is, our common cod, is the fitteſt fiſh for making the different ſorts of ſtockfiſh, whereof we intend to treat; beſides the ſtockfiſh, that is made with *lize*, *wittelingue*, &c. which ſeem to be fiſhes of the genus of *melwels*, *whitings*, &c.

Of the fiſheries, which the Dutch, Engliſh, French, &c. may carry on in the Northern ſeas, together with a general idea of their fiſheries and trade.

People of all nations may fiſh in the northern ſeas, provided they keep at certain diſtances from land; for, the Icelanders, Norwegians, &c. will not allow foreigners to come near ſhore to prepare their fiſh, on which account they are obliged to cure their cod in the green way. If, however, any veſſels have been damaged, they are allowed to enter port for the purpoſe of refitting; but they are watched, to prevent the curing of fiſh on land. Accordingly, all the foreign fiſhers make up their fiſh in the green way, in barrels.

In

In ſome places, the fiſhery can be carried on early in the year, ſometimes, as early as the month of January; the traders, that go to thoſe ſeas, can get the ſtart of the Newfoundland fiſhers, who cannot eſtabliſh themſelves on the bank, before April or May; but then the traders ſhould agree among themſelves, that, as ſoon as between them all they had caught enough for one cargo, the veſſel ſhould be diſpatched to the port, where they intend to diſpoſe of it.

The moſt uſual places for carrying on this fiſhery, are Iceland, Ferol, Shetland, Denmark, Norway, and Kola in Ruſſia. But one of the beſt ſituations for foreigners, is a bank, or reef, between the ſmall iſland of *Ingland*, and the coaſt of *Jutland*, which, being very elevated, defends them from ſtorms. The Engliſh, French, Dutch, Hamburghers, &c. go to the North, not only to fiſh for cod, but likewiſe to purchaſe that, which has been taken and cured by the inhabitants of thoſe countries. Some French traders go with ſmall veſſels of, from twenty to fifty tons burden, but theſe dont go farther than Shetland, where, beſides fiſhing themſelves, they barter proviſions for fiſh. They ſet out about the latter end of April, and return about the latter end of July. The Dutch, beſides the trade, which they carry on with the Icelanders, and other nations of the North, fiſh in the Iceland and Shetland ſea. They make

make up the fiſh in barrels, and on their return they often continue the fiſhery on Dogger's-bank until winter, unleſs they go to Yarmouth, in September, to fiſh for herrings.

The traders of Yarmouth ſet out for this fiſhery with the ſame *ketches*, that they make uſe of for the herring-fiſhery, having twelve men on board. They are but a ſhort time running to Iceland, and Shetland, where they barter goods for ſtock-fiſh, and take a ſituation for fiſhing at fifteen or twenty leagues diſtance from the Orkney Iſlands, where they remain for ſome weeks. They uſually cut their cod flat, and cure it in bulk.

The Engliſh, Dutch, and French, who carry on this fiſhery in the North, fiſh alſo for herrings, pilchards, &c. which ſerve them for bait.

Of curing cod-fiſh in the North, as practiſed by the inhabitants of thoſe countries.

The northern fiſhers prepare ſome green cod in barrels, and with ſalt; they call it *klippfiſh**; it differs but little from what the Dutch call by the ſame name, or by that of *Abberdan*, and is prepared by the Danes in the following manner. When the cod are brought on ſhore, they cut off the

* M. Horrebows derives *klipp-fiſh*, from *klippen*, which ſignifies ſtones, becauſe the fiſh is covered with ſtones.

the heads, open them, take out the entrails, and the large bone, and then put them into veſſels, where they are ſteeped eight days in ſtrong brine, made with French ſalt, if they have any, or, if not, with Portugueſe ſalt. Then they take them out of the brine, and lay them one over another, to let the brine drop out. They even put them under a ſort of preſs, formed of boards, covered with ſtones, and then barrel them with the largeſt Portugueſe ſalt they can procure. This method is very good, according as it is practiſed by the Danes, but not ſo when practiſed by the Icelanders, who cut the fiſh, and go through the whole proceſs ſo badly, that their *klipp-fiſh* is little eſteemed.

The difficulty of procuring caſks forces the Icelanders, and particularly the inhabitants of Norway, from Drontheim, to a degree of latitude above Bergen, to cure fiſh in a manner called *plat-fiſh* (or flat fiſh,) which comes near the dry cod prepared in North America, but without being near ſo white or good, becauſe proper care is not taken to extract the blood. In curing *plat-fiſh*, they ſometimes leave the heads, and at other times cut them off. Having emptied and waſhed the fiſh, which they ſplit open entirely, they ſteep them for half a day in water, to let the blood flow out, after which they waſh them a ſecond time, and leave them heaped up with Spaniſh ſalt for three days. Then they make them up in

new

new piles, to let the brine run off; and when the fiſh is become ſomewhat firm, they put it for ſome time under preſſes, to flatten it, and to preſs out the brine ſtill more. And laſt of all, they lay it out on rocks, or other places, where it is expoſed to the cool air.

As the Shetlanders have but ſmall boats, and the ſea ſurrounding their iſland is ſubject to ſtorms, they cannot fiſh in winter, but make *ſlack-fiſh*, of what they take in ſummer, which is prepared much like the *plat-fiſh* above mentioned. They corn it with white Scotch ſalt, and having left it to drip, lay it out on rocks. They preſerve the heads, which they ſplit open and ſalt; when the heads are dried like the reſt of the fiſh, they keep very well.

The fiſh, that has got a ſalting, is more tender than that dried without ſalt. It keeps alſo for a long time, is more eſteemed, and ſells dearer than the other.

Of Stock-fiſh, or fiſh dried without ſalt.

The word *ſtock-fiſh*, which is a compound of two German words, viz. *ſtock*, which ſignifies wood or ſtick, and *fiſh*, is a generical term for fiſh, that, by drying alone, becomes as hard as a *ſtick*, and is uſed in all the northern languages, to ſignify every ſort of fiſh, which is preſerved with-

out ſalt, merely by being dried. The Norwegians, and the fiſhers of the Baltic, dry almoſt all the fiſh they take, by hanging it by the tail, over ſtoves, with a cord fixed to the cieling of their cabbins; and the fiſh, dried in this manner, (which might be called *ſmoked fiſh,*) as well as that, dried by the wind, is called *ſtock-fiſh*, without diſtinction.

Rondelet ſays, that the merchants of Antwerp have ſhewn him, under the name of ſtock-fiſh, all ſorts of fiſh dried in the air, or with ſmoke, ſuch as rays, ſoles, plaices, turbots, &c. *Stock-fiſh*, therefore, is not a particular ſpecies of fiſh, as ſome authors have imagined; it is from the method of preparing it, that this name is given indiſcriminately to every ſort of fiſh. The Dutch merchants, however, do not provide any other ſtock-fiſh, but torſch, or cod; and in the French provinces, no other fiſh is known under the name of ſtock-fiſh, but cod, dried without ſalt. Beſides the generical name of *ſtock-fiſh*, there are ſome other names uſed in the North, owing to the different methods of curing the fiſh: ſuch as *flackfiſh*, *hengfiſh*, *rotſchair*, *langfiſh*, *rondfiſh*. We ſhall endeavour to give an account of all theſe.

Anderſon remarks very properly, that a perſon, who had no knowledge of any other climates, but of thoſe, temperate and damp like ours, could ſcarce conceive, how ſo large and flat a fiſh, as the torſch, or cod, could be kept for ſeveral years without

out ſalt; for it is a fact, that, if well cured and laid up, it will keep for ten years, and bear to be carried to various climates. The cold and dry North winds, that prevail in ſpring, which is the proper ſeaſon for curing fiſh, prevent fermentation, and dry the fiſh much better, than the damp heat of our climates can do. Even in northern countries, the ſummer is not a proper ſeaſon for drying fiſh, as the ſun breeds inſects, and cauſes a fermentation, which is always hurtful to it. This ſhould be particularly attended to by all fiſhermen.

Of Round-fiſh, or round Stock-fiſh.

The name of *round-fiſh* is given to torſch, or cod, which, when dry, is long, round, and ſtiff, as a ſtick.

They make round-fiſh in all parts of the North; as the Norwegians have the reputation of preparing it better than others, we ſhall deſcribe the method they follow.

Cod cannot be prepared in this manner, but from the beginning of January until the latter end of April, after which time, the air is not dry enough for ſuch large and flat fiſh, which remains almoſt whole.

In the ſouthern part of Iceland, it is uſually too warm in May, to prepare round-fiſh well. It is not ſo on the North ſide of the iſland, where the fiſhery does not begin until the middle of May, on account of the ice, that comes from Greenland.

The curing of round-fish is very ſimple. Having cut off the heads, and opened the fiſh, as far as the *anus*, to empty them, they tie them two by two, by the tail, with a ſtring, and hang them up on poles, laid croſſways. They remain thus expoſed to the air, for ſeven or eight weeks, more or leſs, according to the temperature of the weather. The moſt favourable time is, when there is a cold and dry North wind; the fiſh, becoming dry, ſhrinks, and grows round. When it is in this condition, and very ſtiff, there is no danger from inſects. The Norwegians then lay it up in heaps, like wood for fuel, waiting for purchaſers. It is one of the chief branches of trade, that the Dutch have with Norway. The round-fiſh of Iceland, is not as much eſteemed as that of Norway; whether the difference be owing to the nature of the fiſh, or to the relative dryneſs of the air, is uncertain.

Of Klipp-fiſh, without ſalt.

We have ſaid before, that, the Danes cure torſch, or cod, in the green way, by ſalting them in barrels, much in the ſame manner as the Dutch make abberdan. They call it *Klipp-fiſh*. The Shetlanders make another ſort of klipp-fiſh, which, except its not being ſalted, is very like the dry cod, that the French prepare at Newfoundland.

The

The word, *klipp-fiſh*, is ſaid to ſignify, rock-fiſh, in the language of Shetland, becauſe the fiſh is laid on rocks to be dried.

The manner of preparing it is as follows. Having cut off the heads, ſplit the fiſh in almoſt their whole length, and take out the greateſt part of the large bone, after which, lay them in rows over one another, in large wooden veſſels, which may contain about five hundred fiſhes.

Theſe veſſels are placed on the ſhore, and are filled with ſea-water, in which the fiſh is left for ſeven or eight days. It is then taken out, and laid up in heaps to let the water flow off. Put ſtones upon them, to preſs out the water, and to flatten them. After ſome days, lay them out on rocks, or large ſtones, &c. When the fiſh is perfectly dry, lodge them in ſtore-houſes, and take care to keep them from getting damp. This precaution is neceſſary alſo, when the fiſh is to be ſhipped; for klipp-fiſh, when well prepared, keeps very well, provided it be kept dry, and in the ſhade.

Of Flack-fiſh.

As, in Iceland, the wind is not cold nor dry enough in May, at leaſt in ſome parts of the iſland, to dry up whole fiſh; inſtead of making round-fiſh, they make *flack-fiſh*, a term, which ſignifies

ſignifies *ſplit-fiſh*; according to M. Horrebows, it comes from *flæck*, which means *to lay flat*. Having cut off the head, and opened the body in its whole length, on the ſide of the belly, to take out the entrails, and the large bone, as far as the third vertebra below the anus, they lay them out, if the weather promiſes to be fair, two by two, fleſh againſt fleſh, on benches made of dry ſtones, or on beds of gravel, &c. a foot and a half high. If the weather is not favourable, they form little heaps of fiſh, which are called *caſes*, putting always the ſkin uppermoſt, and leave them in this ſituation, until there comes a dry, cold, and conſtant wind, which ſometimes does not blow for three or four weeks. If this wind comes too late, the fiſh ſuffers ſome alteration, which makes the merchants call it *caſe*.

As ſoon as favourable weather appears, the women undo the *caſes*, and lay out the fiſh on the beds, taking care to turn them two or three times a day, and placing them ſo as that the tail of one correſponds to the neck of the other; and when it rains, they put the ſkin uppermoſt to prevent the fleſh from being ſpotted. Fourteen or fifteen days are ſometimes requiſite to dry it; but, if the North wind is tolerably ſtrong, and very dry, a much ſhorter time will do. They are, however, afraid of a ſharp froſt.

When the fiſh is well dried, they make great heaps of it on the beds, putting heads againſt tails, and

and then there is no danger of its becoming *caſe*. In this ſtate it is left, until the Daniſh merchants come to carry it off. On the way to the ſhip it is covered, to protect it from rain; for it would be ſpoiled at ſea, were it ſhipped wet.

Fiſh, which has been prepared in this manner, is looked upon as more delicate, and ſells better, than round-fiſh. They make flack-fiſh, in Iceland, of ſome other ſorts of fiſh; but the merchants don't eſteem it, and will take no other but flack-fiſh of cod or ling, except when it happens to be very ſcarce.

Of the Rothſchair, or Rodſchier, of Norway, or Rotſkaering, of Denmark.

Theſe terms ſignify fiſh ſplit through the whole length of it, which, when dry, forms, as it were, two long *roots*.

What the Norwegians call *rodſchier*, differs but little from flack-fiſh. They ſplit the fiſh as far as the tail, and take out the large bone. Theſe two pieces, being united or kept together by the tail, are dried, by hanging them up like round-fiſh. The greateſt part of it is made of ſmall cod, taken near the coaſts. This is more delicate than round-fiſh, and is called the *zaart-fiſh* of Norway. Some of it is prepared in the iſlands of Froë and Weſtmenoë; but that of Norway is more eſteemed. It is made in April, at which time round-fiſh could not be made.

Of Heng-fish.

The term, *heng-fish*, ſignifies in the Icelandic language, *hung* fiſh; however, it is prepared in a different manner from flack-fiſh and rodſchier: for, inſtead of opening the fiſh by the belly, they ſplit it in the back, and having quitted it, and taken out the large bone, they hang it up on poles, in a kind of cabbin or ſhed, which they call *hialder*, covered with planks, and ſo conſtructed, that the air can paſs through it. But before they hang it up, they lay it in heaps, to ferment a little, which makes it tender, and then lay it out on a rocky ſoil, or on gravel-beds, &c. to dry a little; after which, it is hung up in the *hialder*, until it becomes perfectly dry. When drying, it does not become round, like round-fiſh. Although it ſells at a higher price than flack-fiſh, yet there is but little of it made, on account of the great trouble in preparing it. The Danes make ſome heng-fiſh of Torſch, for their own uſe; which, as it is better prepared, is much preferable to that of the Icelanders.

Of Shell-fish-Cod, and Abberdahn.

The term, *Shell-fish*, ſignifies *ſcaly* fiſh. Some ſay, it is ſo called, becauſe when boiled, it comes off in flakes or ſcales; but the name comes from the

the *ſhell-fiſh* being made of a kind of fiſh, which is more ſcaly than Torſch; for in Holland, and in Low Germany, the ſcales of fiſh are called *ſchelfen*. It is made of various ſorts of good fiſh, prepared much in the ſame manner as ſtock-fiſh. As to the Abberdahn, which is made of different ſorts of ſmall fiſh, ſalted and dried, there is none of it ſent out of Denmark and Lower Saxony.

OF THE METHODS OF FISHING FOR COD, PRACTISED BY THE NATIVES OF DIFFERENT PARTS OF THE NORTH OF EUROPE.

The manner of fiſhing for cod, or torſch, in the north, differs but little from that, which is practiſed at Newfoundland. When the ſea is not too high, three fiſhermen go out in ſmall boats, about twelve or fourteen feet long, called *ſchuts*, and fiſh with ſimple lines, at a ſhort diſtance from the coaſt. Each fiſherman ſometimes throws out four lines, two at each ſide of the boat. As the fiſh, which comes near the coaſt, is uſually of a ſmall kind, their lines are fine, and the hooks very ſmall.

When they go out farther from ſhore, or if the ſea is high, they uſe ſchuts ſtronger built, of four or five tons burthen, with four or five fiſhermen, and, for the moſt part, uſe oars. But, if they

they are to eſtabliſh their fiſhery in diſtant quarters, they go, eight, ten, or twelve men, in boats of ſeven or eight tons, which they call *ſeules*, and carry ſome proviſions with them.

They bait their hooks with herrings, pilchards, and other ſorts of ſmall fiſh, or, in failure of theſe, with muſcles, five or ſix of which are ſometimes ſufficient to bait a hook. They uſe, alſo, lug-worms, or black-worms, which they gather on the ſtrand at low water.

It is particularly requiſite to have good baits in the north, as the cod is uſually not hungry there: it would bite but ſeldom at the hooks, were they baited only with cod's offals.

They fiſh alſo for cod, with large lines extended on the bottom, called ſpillars; ſome of which are a thouſand fathoms in length, and carry twenty or thirty dozen of hooks. To the end of the leading line they faſten a large ſtone, to keep it fixed; and at the other end of it is a line, at the extremity whereof is a buoy, or leather bag, filled with air, which they call *blaque*, or a little empty barrel, that ſerves as a mark to ſhew where the leading line is. Sometimes, inſtead of this *blaque*, they faſten the line to a rock or a ſtake.

This mode of fiſhing is practiſed alſo by the fiſhers of the north of Scotland. The lines are laid out in the morning, and taken up at noon; it often happens, that three-fourths of the hooks are loaded with cod, or ſome other ſorts of good fiſh; the

the baits are renewed immediately, and the lines laid out again, to be taken up in the evening. Theſe large lines cannot be laid out, but at a little diſtance from the coaſt, and where there is no great depth of water; on which account, it is uſually ſmall fiſh, that is taken with them. This method of fiſhing cannot be uſed in deep water.

It happens ſometimes, that the cod, without being purſued by large fiſhes, collect in great numbers in creeks, where the fiſhery is very good.

When purſued by large fiſhes, they come in ſwarms into the creeks, and ſometimes, ſo precipitately, that many of them are daſhed againſt the coaſt. As they are frightened, they will not bite at the hooks, and therefore, in this caſe, the fiſhermen lay out nets at night acroſs the creeks, and uſually find a great quantity of fiſh in them the next morning.

Cod of the Meuſe.

There is no cod taken either in the Meuſe, or near that coaſt. However, the name of *Cod of the Meuſe* is famous in Holland and Flanders. It is called ſo, becauſe the people, that live in the towns near the mouth of the Meuſe, go out into the German Sea to fiſh for cod, in large boats called *hockers*, in which is a well for keeping the fiſh alive. Such fiſh, as they bring home alive, they put into reſervoirs, through which the water

of

of the Meuſe runs. If they get nouriſhment, they will live for a long time, and become more delicious, than when firſt taken. This is what is properly called the *Cod of the Meuſe*, although a conſiderable quantity of freſh cod, of other ſorts, is ſold under the ſame name.

The Dutch take ſmall cod-fiſh with large nets, which they call *Kol*, and with ſmall ones, called *Beug*.

They ſell the ſtock-fiſh, which they buy in northern countries, in two different manners, viz. firſt, without any alteration, and ſuch as it comes in the ſhips; ſecondly, after having ſteeped it for ſome days in river water, impregnated with lime. This ſort ſells dearer than the other, but is thought to be more hard of digeſtion.

Cod-fiſhing, with Nets.

Fiſhing with nets was introduced ſeveral years ago, in the province of *Sundmeur*, in Norway, on the coaſt between Bergen and Drontheim, and is now univerſally practiſed there; having been found, by experience, to be much more productive than fiſhing with hooks. It is gaining ground more and more every day; ſo that hook-fiſhing is ſcarce in uſe in many parts of Norway, except where fiſhing with nets is not practicable.

Theſe

Theſe nets are made of Dutch or Engliſh twine; the meſhes are three inches and a half ſquare.*

Every piece of net is thirty or thirty-five fathoms long, and twenty-four pieces form the whole, which the Norwegians call *garn ſoettning*. They join them all together, when the fiſhing-banks are large enough. The fiſhermen make all their nets themſelves, and the women ſpin and twiſt the thread.

The nets are mounted on cords, the uppermoſt whereof is as thick as the little finger: to the lower cord are fixed ſeveral little rings, which carry ſmall bags, full of ſtones, whereby the net ſinks to the bottom, and is kept there.

To the uppermoſt cord there are faſtened pieces of very light wood, about ſixteen or eighteen inches long, and two inches broad in the middle, and only one inch broad at the ends. One ſide is ſomewhat curved, and the other quite flat. It is by the flat ſide that they are faſtened to the cord, and ſuch pieces are placed all along the cord, at the diſtance of eighteen inches from each other: they ſerve to keep the nets ſuſpended vertically and firm, ſhould there even be a high ſea, currents, &c.

In a certain ſeaſon of the year, cod quit the bottom of the ſea, and keep in ten, fifteen, or twenty fathom water: to keep the nets at that

* More or leſs; for, as the cod is ſometimes larger, ſometimes ſmaller, they adapt the meſhes to the ſize of the fiſh.

depth,

depth, and prevent them from going to the bottom, the fiſhermen make uſe of ſmall barrels made of oak or deal, whereby the nets are buoyed up, or ſuſpended, at the depth required; ten or twelve of theſe barrels, being placed at equal diſtances, float on the ſurface.

At each end of the fall of the net, is a double cord, ſome fathoms in length, to which is fixed a kind of anchor, called by the Norwegians *krake*, that ſerves to keep the nets in the proper direction. This krake (called a *killoe* in Ireland) is formed of two pieces of wood, joined together in the form of a compaſs, the ends whereof are faſtened in another piece of wood, on which is placed a ſtone ſufficiently large, that is wedged in and kept firm, by the two branches of the krake. The form of this machine prevents it from faſtening in the rocks, on which account it is preferred to anchors. To every krake is annexed a rope, and two cords, at the end of which there are placed one or two barrels, made of deal, that float on the ſurface of the water. The firſt krake has one barrel, which ſhews the beginning of the net, and the ſecond, two, which ſhew the other end of it.

This fiſhery is carried on in boats, much like a yacht, with ſix men; ſome of whom row, as occaſion requires. The dreſs of the Norway fiſhermen is very well contrived, ſo as to ſhelter them from wet and cold.

They

They fiſh for cod twice a year in Norway. In July, they have what they call the *ſummer-fiſhery*, and from Candlemas to Eaſter, what is called the *winter-fiſhery*, which is carried on after the herring-fiſhery, and after the cod has been well fed with herrings. Thus, glutted with food, the cod give up the chace of herrings, to depoſit their ſpawn on the banks, on the coaſt of Norway. This fiſhery is general, both in Sundmeur, and in Northland, as likewiſe at Bergen, and ſupplies the cod's eggs (or ſpawn in bags), uſed in Brittany, in fiſhing for pilchards.

When they ſet out, they take proviſions, nets, and whatever utenſils may be neceſſary. Arrived at their ſtation, which, according to the ſeaſon of the year, is from two to ten leagues from the coaſt, with fifteen, thirty, forty, fifty, or even eighty or ninety fathom water; two men row, according to the direction the nets are to be placed in, and two others (one of whom is always the pilot) are engaged in putting out the nets. They firſt throw out the *krake*, which is fixed to a double rope, longer or ſhorter, according to the depth of water, that the net is to be placed in. The pilot then puts out the nets, which he does by little and little, taking care to unravel them well; then, letting down the bags of ſtones, which two men faſten to the rings or handles, according as the nets are let out. All theſe precautions are requiſite, in order to make the nets fall perpendicularly. When they

they have done with one piece of the net, they put out another, and ſo on, until all the twenty-four pieces are let down, after which they throw out the laſt *krake*, which communicates, as has been ſaid already, with two barrels, that indicate the laſt end of the net.

The net is left there the whole night, and, if the weather is fair, the men ſtay out near it. If not, they return to ſhore, and fix ſome landmarks, that they may be able to find the net the next morning. The pilot then ſets about drawing it up; he begins, by taking up the firſt *krake*, and then draws the nets, taking care not to pull them when the waves lift the boat upwards, but only when it goes down with the water. Meanwhile, two men row on, according as the nets are drawing up. If any part of the nets happens to be faſtened to the rocks, they ſeparate the piece, that has been already drawn up, from thoſe that remain below, and they draw them up by the other end, where the two barrels are. The more fiſh there is in the nets, the eaſier it is to draw them, and, in general, the haling of nets requires more dexterity than ſtrength.

Formerly they uſed to prepare their fiſh in *Sundmeur*, in the ſame manner as they do in Northland, that is, in the ſtock-fiſh way. But ſince the beginning of the laſt war, they have learned to cure cod, according to the method of the Baſques, which, as it brings a better price for the fiſh, is the

the only one they practiſe at preſent. They call it *klipp-fiſh*, becauſe it is dried upon rocks. The preparing of it is, however, leſs troubleſome to the Norwegians, becauſe the pure and ſmart air of their climate dries it up very ſoon. It is alſo whiter than that of the Baſques, and keeps as well. There is a great conſumption of it in the Mediterranean, where it is much eſteemed.

It will not be amiſs here to mention the reaſons, that induce them to prefer fiſhing with nets, to that with hooks.

It is proved by experience, that the cauſe of a fiſhery being unproductive, is not ſo much the ſcarcity of fiſh, as that the fiſh will not bite at the hook, which always happens, when the cod finds fiſh enough to feed upon, which they prefer to the fiſhermen's baits. In this caſe, which is very common, the hook becomes uſeleſs, and no other mode of fiſhing will do but that with nets.

It is with nets that the largeſt and fatteſt fiſh are taken. In the fiſhing ſeaſon, in Norway, if the water is very clear and tranſparent, one may ſee the largeſt and fatteſt fiſh lying at the bottom, while the poorer ſort of fiſh keeps nearer the ſurface of the ſea. The firſt ſort can be taken only with nets, and the other ſort bites at the hook, if it finds nothing better to feed upon, but that is alſo taken in nets.

The cod, that is taken in this manner, affords a much greater quantity of oil and eggs, than that,

which is taken with the hook. The diſtrict of *Sundmeur* furniſhes us with a proof of this aſſertion; for it appears from the regiſter-books of the cuſtom-houſe of Bergen, that, although the produce of the fiſheries of Sundmeur is leſs by two-thirds than that of Northland, yet the difference in the quantity of oil is, but one third.*

Theſe are the principal reaſons, that are aſſigned in favour of fiſhing for cod with nets, beſides ſome others of leſs conſequence, which it is not neceſſary to mention. It would be well worth aſcertaining, if this method, which has been found by many years experience to be ſo advantageous in Norway, could be practiſed with equal ſucceſs by our fiſhers at Newfoundland, Iceland, &c. &c.

In the province of Northland, which belongs to the government of Drontheim, and extends ſixty or eighty leagues along the coaſt, the cod fiſhery is carried on twice in the year, juſt as in Norway. It is very abundant, for there are two or three thouſand boats, and ſeven or eight thouſand men employed in it. The entire produce of their fiſhery is calculated at 180,000 cwt. of dry fiſh, called *ſtock-fiſh*, of which they diſtinguiſh two ſorts, one called *rodſkiaer*, and the other, *round-fiſh*. Theſe are the only methods they have of preparing it; they make rodſkiaere of the fatteſt and thickeſt ſort of cod, and round-fiſh of the reſt.

To form an idea of the importance of the cod-fiſhery, of the diſtrict of Sundmeur, *M. Frameſy* ſays,

* In Northland, they fiſh only with hooks.

ſays, that out of nine pariſhes, which it contains, three alone, (which he had an opportunity of being better acquainted with) fit out two hundred and fifty boats called *Fieurrings*, with ſix men to each boat, in the whole one thouſand five hundred men. Theſe boats, one year with another, take fifty-two thouſand five hundred *vogue* of fiſh. Each *vogue* weighs thirty-ſix lb. (of ſixteen ounces to the lb.) and uſually ſells for a *rix dollar*, or four livres ten ſous, French money. Add to this, that every twenty-ſix *vogues* produce a barrel of oil of two hundred and fifty Pariſian pints, which we may value at eleven rix dollars per barrel; and then add two thouſand barrels of cod's eggs, or roe, each of which is ſold at two rix dollars, and one-third; ſo that the ſum total amounts annually to 318,836 livres, about 13,500 pounds Engliſh money. From this ſum muſt be deducted the expence of fitting out the boats, of keeping the nets, of the barrels, ſalt, &c. &c. all which is calculated at 9000 livres. There remains then a clear profit of 228,836 livres, or 9600 pounds Engliſh, for three pariſhes only. It is proper to obſerve, that nothing can be more frugal than the living of the Norwegian fiſhermen. At ſea they uſually live on freſh fiſh. Their greateſt expence is in brandy and tobacco, which, however, they dont uſe to exceſs. It is very rare to ſee one of them drunk.

OF

SALMON,

AND

OTHER FISH OF THE SAME CLASS.

Salmon paſs from the Sea into the Rivers.

LAYING aſide ſyſtems, and adhering to facts, it is clearly aſcertained, that ſalmon come into the rivers to ſpawn. If any of them are found without eggs or milt, the reaſon of it is, that they have been taken a long time before ſpawning, or a long time after; at which time they were recovered from the ſickneſs, that they are ſubject to in the ſpawning ſeaſon.

When long, thin, and poor ſalmon are found in rivers, we are not to believe, that they become ſo on account of the freſh water's being hurtful to them, as ſome think; but that is owing to their having but juſt got over the ſickneſs cauſed by ſpawning. When they recover from that ſick-

neſs, they grow fat again, and become excellent. Some ſalmon may remain the whole winter in deep rivers, as Camden tells us; but if the fiſhermen did not lay ſnares for them, and would allow them a free regreſs, the greateſt part, if not all, would return to the ſea to ſearch for deep water, and to proteſt themſelves from froſts. After ſix months, they would return again into the freſh water. What makes this conjecture probable is, that, as every fiſherman knows, ſeveral kinds of fiſh come up near the coaſts in ſpring and ſummer, and, on winter's coming on, retire again into deep bottoms.

Some ſalmon depoſit their eggs in the ſea; and theſe are, perhaps, they, which are lean and ſick, when they come into the rivers.

Of the quality of Salmon, according to the places where they are taken.

Salmon are eſteemed, when the head is ſmall proportionably to the body, which ought to be large and round, and the ſcales of a brilliant colour, which is looked upon as a mark of good health; for thoſe that have the ſpawning ſickneſs, are faded, and the ſpots are leſs marked. According to *M. Maſuelle* of Dunkirk, ſalmon ſpawn in freſh water from September to December, during which time they are reputed bad; but, as the greateſt part of them have not ſpawned when they come into the rivers, almoſt all thoſe, that are taken at the mouths of rivers, are good in every ſeaſon.

ſeaſon. In January and February they are in their greateſt perfection. When they are full of eggs, their fleſh is dryer than at other times; they are bad during ſpawning, and for ſome ſhort time after. It is generally believed, that ſalmon taken in the *Loire*, the *Seine*, the *Garonne*, the *Meuſe*, the *Rhine*, and the *Thames*, are ſtronger and fatter than thoſe of *Scotland*, and that, on this account, the Scotch ſalmon is better for ſalting. That of Brittany is ſomewhat leſs eſteemed, than the ſalmon of the rivers we have mentioned.

The ſalmon of the Baltic is large and fat; but its fleſh has little colour, which is attributed to the freſh water that abounds there, eſpecially in the Gulf of Finland. It is ſaid, that the Norway ſalmon is the firmeſt of all; and that the Iriſh ſalmon loſes its colour, when cured, more than that of Scotland.

The rivers, that fall into the German and Baltic ſeas, uſually afford but ſmall ſalmon, which are brought from Hamburgh, and other ports near the Elbe. To this fiſh, which is packed up of all ſorts *pell-mell*, the merchants prefer Engliſh and Scotch ſalmon; it being properly choſen, and each ſort packed by itſelf.

The following Account of a ſingular Method of multiplying and breeding Salmon and Trout, is taken from the Hanover Magazine, No. 62, 1765, and from a Memoir, communicated by Count de Golſtein, Chancellor of the dutchies of Bergues and Juliers, and publiſhed by M. Duhamel. In the Hanover Magazine, No. 23, 1763, it is ſaid, that this method of breeding fiſh had been brought to great perfection by a Mr. Jacobs, of the county of Lippe, in Germany. We do not, however, vouch for the truth of the facts alledged in this ſtatement, as a greater number of experiments would have been neceſſary to confirm them.

A NEW METHOD OF BREEDING SALMON AND TROUT.

1. Let there be conſtructed a wooden box, or trough (oak is the beſt), of whatever dimenſions you pleaſe; for example, twelve feet long, a foot and a half wide, and ſix inches deep.

2. At the head of the trough, where the water is to run in, is laid a thick board about two and a half or three inches thick, about a foot wide, and as long as the trough is wide; in the middle of this board is made a hole ſix inches long, and about four inches wide in the clear, with a ravet on all the four ſides of this hole, about an inch and a half wide and deep, ſo as to admit a ſquare frame with

with an aperture of ſix inches by four inches, or of the ſame ſize of the hole; which frame muſt be covered with a braſs grating (for iron will ruſt) of a moderate ſtrength, and cloſe enough to prevent the ſmalleſt water-mouſe from paſſing through; otherwiſe all the ſpawn and young fry will be in danger of being devoured by them.

3. Near the middle of this box or trough, lay another piece of thick board acroſs, as long as the width of the trough, and about ſix inches or more wide, which, when nailed upon the edges of the ſide pieces, will keep them more ſteady and firm.

4. Let the lower end board, where the water is to run off again, be at leaſt three inches thick, as the greateſt preſſure is againſt it; have an opening cut in at the top, ſix inches wide, and four inches deep; have a ravet made on the outſide, and another on the inſide, deep enough to leave at leaſt an inch thick of the ſolid board in the middle, and wide enough to admit a frame with a braſs-wired grate on the outſide, which can be ſhoved in from the top; the wires ſhould not be above a line and a half aſunder, no more than thoſe at the top, for the ſame reaſon as mentioned before. In the inſide, oppoſite this opening, ſhove a bit of a board in its groove downwards, to ſtem the water either entirely, or to regulate its running off, according as you find it neceſſary, or to pull it entirely out, when the whole of the water is to run off.

5. There muſt be two ſtrong covers, one at each ſide of the middle croſs piece; both covers muſt

muſt be faſtened behind with ſtrong hinges, and before with handles, to lift them conveniently up by; and as the boards are apt to warp, on account of the water within, and the air without, it is requiſite to have each clamped with two or three croſs pieces.

6. If you think fit to give the young fiſh more air than what enters at the two braſs grates, you may have in each cover a hole made of the ſame ſize, and guarded with a braſs-wire grate; this, however, has been found, after repeated obſervations, to be unneceſſary.

7. Spring water, out of rocks or ſtony ground, is the propereſt for breeding of trout and ſalmon; but, where it is not to be had, any other ſpring water may do, provided the current be ſtrong enough, ſo as not to freeze in hard froſty weather.

8. If the ſpring has not fall enough, you muſt raiſe a dam around it, one or two feet higher than the top of your trough; convey the water from thence through a pipe or gutter, to the firſt grate in the opening, on the head part of the trough, of one decimal ſquare inch diameter, and determine its length at leaſt two inches above the grate; the remaining water from the ſpring can be led off ſide-ways.

If you have an inclination for more breeding troughs than one, they ſhould be fixed in the ſame direction as the firſt, and a larger pipe muſt be placed to the head of the ſpring, which muſt empty itſelf into ſmaller pipes, laid acroſs the water-troughs,

troughs, ſo that each trough may have its proper quantity of water conveyed into it; or it may be managed by means of braſs cocks; but this is left to every one's own choice, as the moſt convenient method will be ſoon found out.

9. After the box or trough is properly finiſhed, it muſt be placed horizontally upon two legs of wood, ſtone, or brick; and within upon its bottom put ſome clean-waſhed gravel, level, about the ſize of peaſe and beans, two inches high; afterwards ſprinkle ſome coarſe gravel or pebbles over it, the ſmalleſt of them of the ſize of beans, and ſome bigger than hazel-nuts. This laſt is done, that upon the ſurface of the ſmaller gravel, many deep holes may be formed to prevent, that the continual motion of the water may not carry away the eggs, but that they may remain, where they were at firſt ſprinkled in.

10. Then let the water run into the trough, and riſe it higher or lower, according to the inſtructions, No. 4, ſo that the water may cover the gravel always one or two inches. Take care not to let it run too rapidly, leſt it may carry off the eggs, or diſturb them; for they ought to remain unagitated between the pebbles.

This done, you have accompliſhed all that is neceſſary to the apparatus, for breeding trout and ſalmon.

11. The time of ſpawning is uſually the month of November, at which time the ſalmon, both male and

and female, meet in rivulets in great numbers; and ſuch as are ready for ſpawning, pitch upon a place, where there is large gravel, and where the water has a quick current.

As a ſingle drop of ſperma contains vaſt numbers of animalcula, ſufficient to animate hundreds of eggs, and as the water is loaded at this time with the ſperma, it is no wonder that almoſt every egg becomes a fiſh.

Every egg or ſpawn, in the female, comes to its perfection and ripeneſs at the ſame time and day, but it is not ſo with the ſperma of the male; for the ſperma, or white roe, lies like a ſolid ſubſtance, divided into two parts, in its body, cloſe to the back, and grows gradually fluid, and diſſolves itſelf into a creamy liquid, beginning at the loweſt part, and diſcharges about the ſixth part of each diviſion every day, ſo that within eight days all the ſperma becomes liquid, and runs off.

12. To breed young ſalmon, according to this invention, you muſt have ſome of them taken out of the rivulet in November, when they gather together to ſpawn; as in ſome rivulets their ſpawn becomes later ripe, you may, in the latter end of the month, let part of the water drain off, by ſtemming the water above, that you may take as many out as you want; if, after gently ſtroking their bellies with the fingers, ſome ſpawn or ſperma goes off, it is a ſign that both are ripe, and thoſe muſt be put into a large pail or tub for uſe.

13. Then

13. Then take a wooden, earthen, or copper bowl; put into it a pint, quart, or more, of clear water; take out of your pail one fish after another; ſtroke them with the hand or fingers downwards, till the ſpawn diſcharges into the bowl; you need not fear that it will hurt them, for they can, without danger, bear great preſſing; then rub the belly of the male trout in the ſame manner, till ſome of its milk diſcharges into the water (a little is ſufficient), then ſtir the whole with your hand ſo as to mix it well, and all the eggs or ſpawn will be fructuated; then mix more clear water to them, to diſperſe them more aſunder: after the eggs are impregnated with the ſperma, they are apt to clog together, which hurts them in the end; it is therefore neceſſary to thin them with more water, after which they are to be poured into the breeding-trough.

A ſmall ſpace will receive a great quantity of ſpawn, yet they muſt not lie too thick; otherwiſe, they will get in a few days into putrefaction, and have the appearance, as if a fine downy wool was ſpread over them. To prevent this, take a thin ſlice of wood, or a paddle about the breadth of a hand, and paddle with it backwards and forwards, on the ſpot where the ſpawn lies too thick, to ſpread, by this motion, the ſpawn aſunder.

14. It

14. It will be neceſſary to repeat this manœuvre twice a week, or at leaſt once a week; and by paddling with your wooden ſlice in all parts, you will bring the water upon the eggs into motion; for let the water be ever ſo clear, there will adhere to the eggs, in a few days, a ſubtle filth, which lays the foundation to their corruption, even when the fiſh is already alive in the egg; therefore it is neceſſary to cleanſe them by this gentle means. They may be cleanſed alſo with a feather.

15. After the eggs have been about three weeks in this ſtate, one may perceive through the hard ſkin, a divided black ſpot, which are the the eggs of the young fiſh; the body is too tranſparent to be ſeen with the naked eye, but after four weeks, if you ſqueeze one of the eggs between your fingers, you will ſee the fiſh make a motion and turn within, then you may perceive his form. However, the time neceſſary for the forming of young ſalmon, is not always the ſame. If the water of the ſtream be warm, leſs time is requiſite: there is a difference alſo, according to the temperature of the air.

At laſt, after lying ſome weeks in this ſtate, and under a continual current of running water, the young fiſhes will bore their heads through the ſhell of the egg, and under motion with their bodies will, in about half an hour, free themſelves entirely from the ſhell, with the yolk of the mother egg hanging to their bellies like a ſmall bag; as

ſoon

ſoon as they are out of the egg, they will ſtill be in the cavities between the gravel, and have then the appearance, as if the head of a pin was faſtened to a reddiſh field pea, on account of theſe hanging bags. For three or four weeks they receive their nouriſhment from the ſubſtance contained in this bag, till by degrees, as the fiſhes grow larger, the bag diſappears; then they begin gradually to aſſume the ſhape of fiſhes, and having no further ſuſtenance from this bag, they will ſeek for food themſelves. But as in ſo ſmall a compaſs as this breeding-trough, there cannot be a ſufficient quantity of ſmall inſects to be found for their ſuſtenance, they ſeek for more room, where they may meet with them in greater abundance; they follow then the current of the water, and ſlip through the braſs grate at the end of the box, where you ſhould have a large wooden tub, like a brewer's cooler, or a ſmall clean fiſh-pond, covered with gravel, to receive them, in which they will grow in about ſix months conſiderably.

16. The young fiſh can be kept alſo, after they come out of the eggs, for ten weeks in a large clean vaſe of glaſs, china, or earthen-ware, &c. But, in removing them, care muſt be taken not to hurt them.*

* The author ſhould have ſaid ſomething of the manner of nouriſhing the young fiſh in the veſſels. It is difficult to find worms at that ſeaſon.

Trout

17. Trout may alſo be bred and multiplied in the ſame manner.

I ſhall only obſerve, that their eggs and milts are ripe and abundant, in the months of December and January; and as trout are ſmaller than ſalmon, it is therefore more eaſy * to extract their eggs and milt, without endangering their lives.

18. Fiſhes do not couple together, for the purpoſe of generation, as other animals do; their eggs are not fecundated by the males, before they are dropped.

19. Trout's eggs, eſpecially if they are come to maturity, are quite ſeparate from one another, as likewiſe, from every other part of the fiſh, and are covered with a very hard ſkin or ſhell. There is not then much circulation, *if any at all remains*, between the liquids of the fiſh, and thoſe of the egg. Accordingly, trout's eggs do not putrify as ſoon as the fiſh; and I have ſeen eggs, that were kept ſound for four or five days, after the fiſh was putrified.

20. To convince myſelf of this by experience, I took the ripe eggs of a trout, that had died four days before, and which was quite putrified and ſtinking. I covered them with the milt of a live

* It is not eaſy to comprehend the reaſon of this greater facility, unleſs it be, that trout, being ſmaller than ſalmon, can be held with greater eaſe over the veſſel, that receives the eggs and milt, and that they ſtruggle leſs.

male,

male, and I got fish out of them, just as if the trout had been alive.

21. And whereas, the life of the animalcula of the milt is not so closely connected with that of the fish, which produces them, that the death of the fish should cause immediately the death of the animalcula; but on the contrary, the animalcula preserve life, and their reproductive power, as long as the fluid, which contains them, does not contract any putrefaction: the following sort of paradox is a fact proved by theory and experience.

22. Young trouts can be had by means of the milts and eggs of trouts already dead, and partly putrified.

23. From the facts alledged it appears, that it would be no hard matter to breed trouts in a place, where there never had been any before.

24. The example of mules among quadrupeds, and of breams among fishes, shews, that the mixing of two species produces a third one, which has great affinity with the two first. During the months of November, December, and January, salmon and trout have their eggs and milts in a state of maturity. These two species then can be mixed, and an experiment be made, if there can be produced fishes, that are neither trout nor salmon, but a middle sort between both.

25. We are not to conclude from this, that we shall breed *salmon-trout*; for it will not constitute a different species from the white trout. I have made

made a great number of experiments, which prove, that the difference between ſalmon-trouts and thoſe of the other ſort, proceeds in part from the nature of the water in which they live, and principally from their food.* We have in our neighbourhood a pond, wherein all the trouts, that are thrown into it young, become almoſt *ſalmon-trouts* in the courſe of a year. It receives a ſtream, the water of which is of the beſt quality, very fit for diſſolving ſoap, and contains a great number of little barbels. We generally find ſalmon-trout in all the ſtreams, that have water of this ſort, and that abound in barbels.

26. Pikes ſpawn in March; and trouts, as we have ſaid, in December and January. Some trouts ſpawn in February, but this happens very rarely. If, then, trout's eggs could be kept until March, we might try if pike's *milt*, poured upon trout's *eggs*, would produce a third ſpecies.

27. It is proper to obſerve, that mongrel animals have not the power of reproducing themſelves; whence it is evident, that God, in the creation of nature, has determined the number of ſpecies, that were to exiſt.

28. The eggs of ſalmon and trout rot infallibly, if there remains any dirt upon them, or, if they continue for a conſiderable time to lie on earth,

* M. Duhamel has elſewhere ſome obſervations, which do not accord with what is ſaid here, of the colour of trout's flesh.

even ſhould the young ones be already formed. I have been aſſured of it by ſeveral experiments, and this is the reaſon, why they have received from nature the inſtinct of depoſiting their eggs on the gravel of ſtreams, in places, where the running water keeps them conſtantly clean.

29. Trout, in ponds, do indeed depoſit their *eggs* and *milt* in them, in the proper ſeaſon. Theſe eggs inevitably fall upon mud or earth; but, if there happens to be a gravelly, rocky, or ſandy bottom, it is there that the trout ſpawns, and by moving itſelf, it works as hard as it can to cleanſe its eggs: but, the moſt it can do is to keep them clean for about eight days. It is a certain fact, that whatever remains conſtantly in water, let the water be ever ſo clean, contracts ſome dirt from day to day. It is impoſſible to keep trout's eggs in it for the ſpace of ten weeks, without their becoming dirty. On this account, the ſpawn of trouts never turns out well in ponds, unleſs in places where there is a gravelly bottom, and where there are ſprings, or ſtreams of running water.

30. However, ſometimes young fry of trouts are found in ponds, and people think they were produced there. But, in ſuch caſes they will find, that near the pond, there is ſome ſpring or ſtream with a gravelly bottom. The trouts aſcend, in December and January, from the ponds into theſe ſtreams, for the purpoſe of dropping their eggs

and

and milt. The young ones afterwards come down into the ponds, in ſearch of water and nouriſhment.

31. From theſe obſervations, it appears, that trouts cannot multiply in ponds. On the other hand, we know, that it would be impoſſible to procure every year a young brood out of ſtreams. Beſides, we don't find trouts in every ſtream, although there ſhould be ponds near, fit for feeding them. Therefore, this method of procuring trouts, by means of the eggs and milt, muſt be uſeful in many places, beſides the pleaſure and amuſement of breeding them.

32. Salmon in their ſpawning ſeaſon paſs, as trouts do, from deep rivers into *pebbled* ſtreams, and having ſpawned there, return to the rivers, where the fry come to ſeek them as ſoon as they can. Such is the inſtinct which nature has given them; whence we may conclude, that young ſalmon do not remain in ſtreams, and that it is difficult to keep them in ponds, if large ſtreams run through them.

33. The voracious fiſhes of our countries, ſuch as pike, trout, &c. when they are kept in ponds, feed principally upon water-rats, frogs, &c. and as ſalmon uſe the ſame food, it would be well done to throw a great quantity of them into the ponds, where they are intended to be reared.

34. The water of ponds or lakes fit for feeding carp, is uſually of the ſame degree of warmth, as that, in which ſalmon like to remain; ſo that ponds

of a certain temperature are fitter for them than cold ponds, which are preferred by trouts.

35. As ſalmon do not ſpawn in ponds, and as it is very difficult to procure a ſtock of young ones from rivers, our method, therefore, of multiplying them, may be very uſeful, provided there be food enough for them in the ponds.

36. I have now actually * 430 ſmall ſalmon, of the firſt experiment that I made. When they were ſix weeks old, I diſtributed them into ſeveral ſmall ponds. At the end of the year I ſhall be able to determine, whether it be profitable to keep and feed ſalmon in ponds.†

OF THE USE, THAT IS MADE OF SALMON, TROUT, AND OTHER FISH OF THIS SPECIES, AND OF THE DIFFERENT METHODS OF PRESERVING THEM.

Of freſh Salmon.

Salmon can be kept freſh for a conſiderable time, provided the weather be cool. Fiſh, if *frozen*, keeps as long as you pleaſe. In this manner the Canadians preſerve their proviſions during

* Theſe are the words of the author of the Memoir, communicated by Count de Golſtein.

† We know not the reſult of this experiment.

the

the whole winter, if no thaw come on. The Chineſe build a kind of ice-houſe on their boats, by means of which fiſh is brought freſh and in good order to Canton, from very diſtant provinces. In France, the chaſſes-marée, or fiſh-machines, carry fiſh to a great diſtance in froſty weather; but in that country the froſt does not uſually laſt long enough, ſo as to ſpeculate with certainty upon this manner of keeping fiſh; for it often happens, that thaws come on all of a ſudden, whereby the fiſh-carriers ſuffer great loſſes.

But even without froſt, ſalmon can be carried in good condition to the diſtance of fifty, ſixty, or eighty leagues, if the weather be cool; for it is brought freſh by ſea from ſome ports of Scotland to London in cool weather, and, when the paſſage is not retarded by calms or contrary winds, is good. For this purpoſe, the Scotch take out the gills, and gut the ſalmon. They do not waſh them, but put bundles of very clean ſtraw into them, and lay them in baſkets upon long ſtraw, ſo that they do not touch one another. If, during the paſſage, they have contrary winds, warm weather, or ſtorms, whereby the fiſh might be ſpoiled, they ſalt them, or pickle them, as we ſhall explain hereafter.

Of keeping Salmon in melted butter.

By this method, which is uſed in Holland, ſalmon can be kept for a fortnight or three weeks, almoſt

almoſt as good, as if it were taken only three or four days before. It is indeed too expenſive and troubleſome to form an object of trade, and is done in the following manner.

As ſoon as the fiſh is caught, they cut off the end of the ſnout, and hang it up by the tail, to let the blood flow out as much as poſſible. A ſhort time after, they open its belly, and empty it, and waſh it carefully. Then they boil it whole, in a brine of white ſalt, often ſkimmed. Before it is quite boiled, they take it out of the brine, and are careful not to injure the ſkin, after which, they let it cool and drip on a hurdle. Then they expoſe it for a day or two, to the ſmoke of a fire made of juniper, which muſt make no flame. Finally, they put it into a tin box, the ſides of which muſt be about an inch higher than the thickneſs of the fiſh, and fill up the box with freſh butter, ſalted and melted. When the butter is coagulated, they put on the cover, and ſoder it to the lower part of the box. Some perſons eat the fiſh without boiling it again, but it is better, when it gets a ſecond boiling. In winter, good oil of olives may be uſed inſtead of butter.

Of pickled Salmon.

Salmon ought to be pickled, before the warm weather ſets in. They dont pickle ſalmon in Scotland, after the beginning of May; from that time, they ſalt and barrel it.

In

In Holland, as ſoon as the ſalmon is caught, they cut off the *jowl*, which they ſplit into two parts, and cut the reſt of it (as far down as below the *anus*) into pieces about three inches thick. The tail may be left long at pleaſure. All theſe pieces are put into a large veſſel full of freſh water, in which they are waſhed with care; the water is changed three times, ſo as to take out all the blood. Each piece is faſtened ſeparately to ſmall laths, to prevent their touching one another. They then boil, apart, as much water, as may ſerve to cover all the fiſh, to which they add two bottles of *Rheniſh wine*, a bottle of good vinegar, ſome mace, cloves, pepper in grain, or long Portugueſe pepper, coriander ſeed, thyme, leaves of laurel, a clove of garlic, and more or leſs ſalt, according as they intend, that the ſalmon ſhould keep for a longer or a ſhorter time. When this water boils, they put the pieces of ſalmon into it, placing the *jowls* uppermoſt, as they boil ſooner than the reſt, and when the whole is boiled, they take it out, and let it drip on a linen cloth. When the water has cooled, they paſs it through a ſearce, or ſieve; then they put the ſalmon, in pieces, into an earthen jar or pot, upon a bed of leaves of laurel, and throw between the pieces a little ſalt and ſome ſlices of lemon. They then pour upon it the ſauce, in which the ſalmon was boiled, until it is quite covered, and fill up the veſſel with the jowls and tails; after which they pour good oil upon it, and cloſe the veſſel. Salmon, prepared in this manner, will keep a conſiderable time.

Of

Of ſmoked Salmon.

This method of curing ſalmon comes near to that of curing herrings. It is practiſed in England, Scotland, and Holland, but not near ſo much as in the North. As the methods are nearly the ſame in all theſe countries, we will deſcribe that, which is uſed in Holland.

When a ſalmon is caught, they cut off its ſnout, and hang it up by the tail to let the blood flow out; then they open it from one end to the other, without ſeparating the jowl from the body; they take out the gills, gut it, and waſh it. They put white ſalt upon it, and leave it in this ſtate for twenty-four or thirty-ſix hours, more or leſs, according to the time they intend it ſhould keep.

Thus covered with ſalt, ſome place it between two boards, which they hang up in a cool and dry place, not only for the purpoſe of flattening it, but likewiſe to make the fat and lymph drop out. It is then to be expoſed to the ſmoke; but to make the fiſh retain a flat form, they place ſome ſmall thin laths acroſs, which they faſten to the ſkin of the back.

It is ſmoked with pieces of oak, or juniper, which are burnt in ſuch a manner, as to give ſmoke with flame. Having been thus ſmoked for three days, it is hung up in the air for twenty-four

four hours, and they continue to expoſe it, alternately, to the air and ſmoke for a fortnight or three weeks.

Smoked ſalmon muſt not be piled up like dry cod; for, as it is a very oily fiſh, it would be ſpoiled. It muſt be hung up in the air, and it is even neceſſary to expoſe it from time to time to the ſmoke.

When it is to be carried from one place to another, each fiſh is wrapped up ſeparately in long ſtraw, ſo that they do not touch one another.

Salmon cured in this manner keeps as long as herrings; however, it is never ſo good as after a month or two.

They make ſmoked ſalmon in Ruſſia, Livonia, Sweden, &c. The preparation of it differs but little from that, which we have juſt deſcribed. They empty the jowl and belly, and ſplit it on the belly ſide from one end to the other. They take out the large bone, and waſh the fiſh in water, and in its own blood; they put it then into a ſort of trough filled with ſtrong brine, and leave it there for two, three, or four days. Then, after having pierced it with ſome thin laths, or ſticks, to keep it open and flat, they hang it up for four or five days in a ſquare chimney, which is almoſt cloſed above, and ſmoke it with juniper or alder roots, which muſt emit no flame. Afterwards they barrel it, and, although it has been cured in a very negligent manner, they export an immenſity

ty of it to a great many different countries, eſpecially to Germany.

We ſhall conclude this ſubject with the ſmoked ſalmon of Bergen and Finmarck, which is conſidered as ſuperior to any other, that is made in the North. There are exported every year from Finmark and Bergen, five or ſix hundred barrels of ſalmon, each of which weighs more than three hundred and twenty lb. This quantity of ſalmon is amply furniſhed by three great rivers, in which the natives fiſh with nets, taken up and laid out, evening and morning.

As ſoon as the ſalmon are taken, they cut off the jowls and tails, and ſplit them into two, from one end to the other. Then they lay them out upon gravel or rocks, with the fleſhy part uppermoſt, much in the ſame manner as is done with cod; after which they ſalt them with French ſalt. When they have taken the ſalt for twenty-four hours, they are waſhed carefully, and then hung up extended in the funnel of a chimney, and expoſed to the ſmoke of juniper without flame. A great quantity of this ſalmon is exported to Holland, Hamburgh, &c.

Of dried Salmon.

They make heng-fiſh, flac-fiſh, round-fiſh, &c. of ſalmon in the North, as we have already explained of cod.

In

Of ſalted Salmon.

In places, where a great quantity of ſalmon is taken, and where it cannot be all conſumed freſh, it is ſalted, eſpecially after the warm weather ſets in; for then it is not good either pickled or ſmoked. Although Hamburgh and ſeveral other Northern ports carry on this trade, almoſt all the ſalt ſalmon, that is conſumed in France, comes from England, or Scotland, as it is of a good quality, properly ſalted and made up.

Some ſalmon are ſalted in the ſame manner as green cod is. They empty the heads and bellies, waſh them, cut them by the back, without taking out the large bone, and then give them a firſt ſalting for three or four days, ſometimes in boxes, layer upon layer, with ſalt between the layers, and at other times in ſtrong brine. When the fiſh has taken the ſalt, they let the water drop off, and then barrel them, putting in freſh ſalt. The Iriſh keep their fiſh for a month or ſix weeks in the firſt ſalt, after which, in barreling it, they give it another ſalting. In Weſt Bothnia, they gut the ſalmon, and, having cut them into four pieces, put them into large veſſels, and cover them entirely with ſalt. They leave them in this ſtate for ſeveral months, until the beginning of Autumn, at which time they take them out, waſh them carefully, and then pack them up in barrels made

of

of deal, without putting in any ſalt. But, when the barrels are full, they pour into them as much ſtrong brine as poſſible, which is ſufficient for preſerving the fiſh. We ſhall now deſcribe the method, that is practiſed in Scotland.

We have remarked before, that the Scotch ſalmon is not too fat; a circumſtance, which contributes much to its preſervation. As ſoon as poſſible after they return from fiſhing, they ſplit the ſalmon in the ſame manner as is done with flat cod, except, that cod is cut along the *belly*, and ſalmon along the *back*, from the head, to where the fin of the tail begins, and often leave the large bone ſticking to the fleſh of one of the ſides.

Having cut the fiſh in this manner, taken out the gills, emptied it, and, ſometimes, taken off a part of the large bone, they waſh it in ſea water, if they have it convenient to them, or, if not, in freſh water, to take out all the blood, which has a great tendency to putrefaction. This ſeems to be a much better method, than that of waſhing the fiſh in its own blood, as is uſed in the North, probably for the purpoſe of making the fleſh *redder*.

When the fiſh has dripped, they put it into large tubs, with French or Spaniſh ſalt over it and under it. It is ſuppoſed that Spaniſh ſalt gives it a more reddiſh colour than French ſalt, but that French ſalt gives a leſs ſharp taſte. Some leave the fiſh in ſalt for eight or ten days, and then barrel them. Others put them without ſalt into large tubs,

tubs, filled with ſtrong brine, and leave them there for a month or ſix weeks, and ſometimes longer, waiting until there may be a call for them: for it is thought, that ſalmon keeps better in thoſe large veſſels, than in barrels; but care muſt be taken to have it conſtantly covered with brine. Laſtly, it is to be taken out of the tubs, and barrelled.

In the bottom of the barrel, they put four or five ſmall ſalmon, and then lay on the large good ſalmon, preſſing them together as much as poſſible, and putting a little ſalt between them. In the top of the barrel, likewiſe, they put ſome ſmall ſalmon. When the barrel is full, they pour in a ſmall quantity of ſtrong brine, and immediately cloſe it up; for it is neceſſary to guard the fiſh againſt the contact of the air, and to prevent the brine from being loſt. Without theſe precautions, the ſalmon would grow yellow and ruſty, and would contract a bad ſmell. Large ſalmon is more liable to theſe inconveniencies than the ſmaller ſort, and, therefore, requires more ſalt in the barreling of it. It is more difficult to preſerve ſalmon than cod. The Scotch take care not to mix ſalmon of different ſorts and qualities, in the ſame barrels, and not to export ſuch as are bad. There is a bounty on every barrel exported, and there are inſpectors in every port of Scotland, whoſe buſineſs it is to enquire into, and certify the good quality, ſpecies, &c. of the fiſh. When the barrels arrive at their place of deſtination, they ought to be filled again with freſh brine.

From

From the firſt Volume of the Tranſactions of the Highland Society of Scotland.

Kippered ſalmon are prepared by cutting them ſmoothly along the back, from the tail to the head. The chine, or back-bone, is then cut out, and all the blood and garbage cleared away. The fiſhes are then ſalted, and laid above each other, with the fleſhy ſides in contact, in a trough, commonly ſcooped out of a ſolid piece of beech, placed in a cool ſituation. A lid, which exactly fits the aperture, is placed above them, and preſſed down by heavy weights. After the fiſhes have imbibed a ſufficient quantity of the pickle, they are ſtretched upon ſmall ſpars of wood, and hung up to dry where there is a current of air. Sometimes they are hung in the ſmoke of a kitchen fire, which preſerves, indeed, but conveys a bad flavour. Some, in order to communicate a particular flavour, mix ſpices with the ſalt; or, they rub the fiſh with ſpices, before they are hung up to dry.

But might not ſalmon, and every ſpecies of freſh-water trouts, be preſerved by ſmoking, in the way hams and ſmoked herrings are preſerved? They might alſo be cured in the way, that what are called *potted* ſalmon, and herrings, are commonly prepared; or in the way the people in Cumberland preſerve their char. The Loch-Leven trouts are conveyed to London, packed in *ice*.

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Fifty years ago, the veſſels, employed to carry ſalmon from Berwick to London, generally took ſeveral weeks in performing the voyage. They were *well*-veſſels, of about forty tons burden each. Theſe veſſels belonged to Harwick and Graves-end; and as they came here ſolely on account of the ſalmon trade, they always went away again at the cloſe of the fiſhing ſeaſon, and two of the largeſt remained all the winter, for the purpoſe already mentioned. There are at preſent twenty-one ſmacks employed by two fiſhing companies of this place, in that trade, and in carrying other goods to and from London and Leith.

The conſequence of the ſalmon-fiſhing here, may appear from the following tolerable exact ſtatement. The yearly rental of the fiſheries in the Tweed, for the courſe of a few miles, amounted to between 7000 and 8000l. in which between ſeventy-five and eighty boats, with about 300 men, are conſtantly employed during the ſalmon fiſhery, between the 10th of January and the 10th of October. There have been known to have been 40,000 *kits*, or upwards (of pickled ſalmon), ſent from this town in the courſe of the ſeaſon, beſides a vaſt

a vaſt quantity of ſalmon-trout, ſent alive to London. The number of *kits* has not been ſo great for a few years paſt, owing to a method of ſending great quantities of ſalmon freſh to London, during all the ſummer ſeaſon, *packed in ice*, collected in the winter ſeaſon, and preſerved through the whole ſummer for that purpoſe.

NOTE.

TO ſhew the great importance of the Herring Fiſhery, when Herring's are cured in the Dutch manner, as detailed in the foregoing ſheets; and to point out to our merchants the great advantage of this trade, we have ſelected part of the Report of the Committee of the Britiſh Houſe of Commons on the Britiſh Fiſheries, made in the laſt Seſſions of Parliament. The gentleman whoſe examination forms part of the Report, is one whoſe literary talents are deſervedly eſteemed, and on whoſe judgment, a very conſiderable degree of reliance may be placed.

EXAMINATION OF THE

REV. HERBERT MARSH.

HAVE you reſided a conſiderable time in Germany; and how long?

About twelve years at Leipſic, and have travelled for about twelve months in other parts.

You having reſided ſo long in Germany, ſtate what you may know reſpecting the quantity of herrings, and other ſalted fiſh conſumed in that country; the places where they are ſold and conſumed; the prices given for them; the ſorts which are preferred;

ferred; the manner in which they are conveyed into the interior of the country, and the mode of cooking and eating them?

The quantity of white ſalted herrings conſumed during the laſt two or three years in Germany (including all the dominions of the king of Pruſſia) may be eſtimated at about an hundred and thirty thouſand barrels annually, which is much leſs, however, than uſed to be conſumed in that country, as complaints are continually heard at preſent in Germany about the ſcarcity of that article. The grounds on which I eſtimate the conſumption of white ſalted herrings in Germany during the laſt two or three years, are the following: In the year 1798, the exact number of barrels imported to Hamburgh was 12,674, and in 1799, they amounted exactly to 13,067, as appears from the printed liſts which are annually publiſhed at Hamburgh. I do not know the exact number imported at Bremen within the laſt two years; but according to a liſt of the year 1790, the number of barrels of herrings brought to that part amounted to 10,205, and in the ſame year the number of barrels of herrings brought to Hamburgh, amounted to 17,179. If we make therefore a proportional deduction for Bremen, we muſt eſtimate the preſent importation then at only about 8,000. The port of Altona, which is contiguous to Hamburgh, is ſupplied by the buſſes, which are fitted out at Altona, and carry on the herring fiſhery from the Shetland Iſlands Southward, in the ſame manner as the Dutch uſed to do. The number of buſſes, which ſailed in 1799 from Altona, amounted to about 26, as I was lately informed there; and as it is a very moderate eſtimate that each of theſe buſſes caught a thouſand barrels between the 24th of June and the end of the fiſhing ſeaſon, we may aſſume that at leaſt 26,000 barrels were brought to Altona in 1799. The exact number of buſſes which ſailed from Emden laſt year I do not know; but as 40 have ſailed from that port ſeveral years ago, and there is no reaſon to ſuppoſe that their number has diminiſhed ſince the Dutch have been prevented from getting out, we ſhall hardly exceed the truth, if we ſuppoſe that at leaſt 40,000 barrels were brought

brought laſt year to Emden. According to the foregoing eſtimate then, to the four German ports, on the North Sea, Hamburgh, Altona, Bremen, and Emden, were brought about 87,000 barrels of white ſalted herrings. To determine the quantity brought to the German ports on the Baltic, I have no other method than by comparing the number of veſſels laden with herrings which paſſed the ſound, with the probable ſhare of them which went to German ports on the Baltic: now it appears, from the liſts publiſhed at Elſineur, that the exact number of veſſels laden with white ſalted herrings, which paſſed the ſound in 1799, was 338, of which 287 were Swediſh (from Gothenburg, Marſtrand, Uddewalla, &c.) 43 Norwegian, five from Emden, one from Altona, one from Aalborg, and one from Leith. We ſhall hardly exceed the truth, if we aſſume, that one-third of theſe veſſels were bound to German ports on the Baltic, as Lubec, Roſtock, Stralſund, Wolgaſt, Stettin, Dantzick, Pellan, Konningſberg, &c. and that each veſſel held, on an average, 400 barrels. According to this computation, the German ports on the Baltic received more than 45,000 barrels, which, added to thoſe received by the German ports on the North Sea, eſtimated at 87,000, make a total of 130,000; and I have been informed by ſeveral merchants in Germany, who import herrings, that before the Dutch were prevented by the war from ſending out their buſſes, the conſumption of white ſalted herrings in Germany was very greatly ſuperior to the preſent conſumption.

Of the quantity of other merchantable fiſh, ſuch as ſalted cod, dried cod, tuſk, ling, &c. annually conſumed in Germany, in general I am unable to form any particular eſtimate; but it appears from the Hamburgh printed liſts, that the importation of the preceding kinds of fiſh to that port is very conſiderable; and that the country from which they are chiefly brought at preſent is Norway. It is probable alſo that Norway will continue to ſupply the German market at all times with dried cod, becauſe in the northern part of Norway, where the cod fiſhery is carried

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on in the middle of winter, the cold is ſo ſevere, and the air at the ſame time ſo very ſerene, that the mere drying of the cod in the open air, without the uſe of ſalt, is ſufficient to preſerve it, which is an advantage and a ſaving not to be had elſewhere. Beſides, the Germans are more fond of the Norwegian unſalted dried cod, than they are of the dried cod which had been previouſly ſalted. The ſalted or pickled cod, called by the Germans Laberdan, is leſs valued by them than the dried cod, which they call ſtock fiſh, inſomuch that in the year 1798, only 488 barrels of ſalted cod (or Laberdan) were imported at Hamburgh, and in 1799 the importation was reduced to merely eight barrels, which were brought from Shetland. But ſalted ling appears to have met with better ſucceſs; and it is highly probable that Scottiſh ſalted ling, eſpecially the barra ling, which is in great eſtimation, might be ſent to Hamburgh with advantage. An attempt at an exportation of ſalted ling was made from Leith to Hamburgh in 1798, and the ſpeculation muſt have been attended with ſome ſucceſs, as in the following year, 1799, were imported from Leith to Hamburgh 140 cwt. of ſalted ling, as appears from the Hamburgh printed liſts. It is true, that this quantity was very ſmall in compariſon of what was brought to Hamburgh in the ſame year from Bergen, Drontheim, and Chriſtiana; but it may ſerve at leaſt as an encouragement to future adventurers from North Britain.

With reſpect to the places in Germany where herrings are chiefly ſold and conſumed, it may be obſerved, that in addition to the above-mentioned ſea ports, almoſt every town in Germany expoſes ſalted herrings to ſale, either wholeſale or retail; and the adjacent villages are ſupplied by hawkers from the reſpective towns. The mode of conveying the herrings into the interior of Germany is partly by means of the rivers, and partly by land carriage. Herrings ſent to Leipzig, Dreſden, and other parts of the Electorate of Saxony, are carried on the Elbe from Hamburgh to Magdeburg in Barges, and from Magdeburg to Leipzig, &c. they are brought by land. Thoſe ſent to Berlin have

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the whole way water carriage both from Hamburgh and Stettin; herrings imported at Bremen are ſent up the Weſer, and formerly immenſe quantities uſed to be ſent up the Rhine by the Dutch, to Cologne, Mayntz, Frankfort on the Mein, Manheim, &c. whence they were further ſent on the Mein and the Necker into the interior of Franconia and Suabia. Herrings deſtined for Bohemia and Auſtria are ſent by ſea to Stettin, and are thence conveyed in the Oder Barges, as high up as poſſible into Sileſia, whence they are further carried by land.

In regard to the value ſet on different kinds of herrings, a decided preference is given in Germany to Dutch herrings; inſomuch that though Swediſh herrings were latterly ſold at a third and even fourth of what Dutch herrings were ſold for, none but the pooreſt people would purchaſe Swediſh herrings, as long as they could get Dutch, or at leaſt herrings cured in the Dutch manner. The people of Emden and Altona have learnt from the Dutch their method, though they have not hitherto in every point the Dutch excellence; and I have been told by perſons in the trade, that herrings cured by the people of Altona do not keep ſo well as the Dutch herrings.

Of the prices of Dutch herrings, as ſold per barrel in the Dutch ports. I have procured a liſt for ten ſucceſſive years, from 1788 to 1797, which was the laſt year that Dutch herrings could be procured.

Theſe prices were as follows:

Years.	Rix Dollars.	Years.	Rix Dollars.
1788	13	1793	10h
1789	13	1794	17
1790	12	1795	16
1791	12	1796	19
1792	8h	1797	25

When the courſe of exchange is at par, ſix rix dollars are equivalent to one pound ſterling and five or ſix pence; ſo that in

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You having reſided ſo long in Germany, ſtate what you may know reſpecting the quantity of herrings, and other ſalted fiſh conſumed in that country; the places where they are ſold and conſumed; the prices given for them; the ſorts which are preferred;

ferred; the manner in which they are conveyed into the interior of the country, and the mode of cooking and eating them?

The quantity of white ſalted herrings conſumed during the laſt two or three years in Germany (including all the dominions of the king of Pruſſia) may be eſtimated at about an hundred and thirty thouſand barrels annually, which is much leſs, however, than uſed to be conſumed in that country, as complaints are continually heard at preſent in Germany about the ſcarcity of that article. The grounds on which I eſtimate the conſumption of white ſalted herrings in Germany during the laſt two or three years, are the following: In the year 1798, the exact number of barrels imported to Hamburgh was 12,674, and in 1799, they amounted exactly to 13,067, as appears from the printed liſts which are annually publiſhed at Hamburgh. I do not know the exact number imported at Bremen within the laſt two years; but according to a liſt of the year 1790, the number of barrels of herrings brought to that part amounted to 10,205, and in the ſame year the number of barrels of herrings brought to Hamburgh, amounted to 17,179. If we make therefore a proportional deduction for Bremen, we muſt eſtimate the preſent importation then at only about 8,000. The port of Altona, which is contiguous to Hamburgh, is ſupplied by the buſſes, which are fitted out at Altona, and carry on the herring fiſhery from the Shetland Iſlands Southward, in the ſame manner as the Dutch uſed to do. The number of buſſes, which ſailed in 1799 from Altona, amounted to about 26, as I was lately informed there; and as it is a very moderate eſtimate that each of theſe buſſes caught a thouſand barrels between the 24th of June and the end of the fiſhing ſeaſon, we may aſſume that at leaſt 26,000 barrels were brought to Altona in 1799. The exact number of buſſes which ſailed from Emden laſt year I do not know; but as 40 have ſailed from that port ſeveral years ago, and there is no reaſon to ſuppoſe that their number has diminiſhed ſince the Dutch have been prevented from getting out, we ſhall hardly exceed the truth, if we ſuppoſe that at leaſt 40,000 barrels were

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brought laſt year to Emden. According to the foregoing eſtimate then, to the four German ports, on the North Sea, Hamburgh, Altona, Bremen, and Emden, were brought about 87,000 barrels of white ſalted herrings. To determine the quantity brought to the German ports on the Baltic, I have no other method than by comparing the number of veſſels laden with herrings which paſſed the ſound, with the probable ſhare of them which went to German ports on the Baltic: now it appears, from the liſts publiſhed at Elſineur, that the exact number of veſſels laden with white ſalted herrings, which paſſed the ſound in 1799, was 338, of which 287 were Swediſh (from Gothenburg, Marſtrand, Uddewalla, &c.) 43 Norwegian, five from Emden, one from Altona, one from Aalborg, and one from Leith. We ſhall hardly exceed the truth, if we aſſume, that one-third of theſe veſſels were bound to German ports on the Baltic, as Lubec, Roſtock, Stralſund, Wolgaſt, Stettin, Dantzick, Pellan, Konningſberg, &c. and that each veſſel held, on an average, 400 barrels. According to this computation, the German ports on the Baltic received more than 45,000 barrels, which, added to thoſe received by the German ports on the North Sea, eſtimated at 87,000, make a total of 130,000; and I have been informed by ſeveral merchants in Germany, who import herrings, that before the Dutch were prevented by the war from ſending out their buſſes, the conſumption of white ſalted herrings in Germany was very greatly ſuperior to the preſent conſumption.

Of the quantity of other merchantable fiſh, ſuch as ſalted cod, dried cod, tuſk, ling, &c. annually conſumed in Germany, in general I am unable to form any particular eſtimate; but it appears from the Hamburgh printed liſts, that the importation of the preceding kinds of fiſh to that port is very conſiderable; and that the country from which they are chiefly brought at preſent is Norway. It is probable alſo that Norway will continue to ſupply the German market at all times with dried cod, becauſe in the northern part of Norway, where the cod fiſhery is carried

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on in the middle of winter, the cold is ſo ſevere, and the air at the ſame time ſo very ſerene, that the mere drying of the cod in the open air, without the uſe of ſalt, is ſufficient to preſerve it, which is an advantage and a ſaving not to be had elſewhere. Beſides, the Germans are more fond of the Norwegian unſalted dried cod, than they are of the dried cod which had been previouſly ſalted. The ſalted or pickled cod, called by the Germans Laberdan, is leſs valued by them than the dried cod, which they call ſtock fiſh, inſomuch that in the year 1798, only 488 barrels of ſalted cod (or Laberdan) were imported at Hamburgh, and in 1799 the importation was reduced to merely eight barrels, which were brought from Shetland. But ſalted ling appears to have met with better ſucceſs; and it is highly probable that Scottiſh ſalted ling, eſpecially the barra ling, which is in great eſtimation, might be ſent to Hamburgh with advantage. An attempt at an exportation of ſalted ling was made from Leith to Hamburgh in 1798, and the ſpeculation muſt have been attended with ſome ſucceſs, as in the following year, 1799, were imported from Leith to Hamburgh 140 cwt. of ſalted ling, as appears from the Hamburgh printed liſts. It is true, that this quantity was very ſmall in compariſon of what was brought to Hamburgh in the ſame year from Bergen, Drontheim, and Chriſtiana; but it may ſerve at leaſt as an encouragement to future adventurers from North Britain.

With reſpect to the places in Germany where herrings are chiefly ſold and conſumed, it may be obſerved, that in addition to the above-mentioned ſea ports, almoſt every town in Germany expoſes ſalted herrings to ſale, either wholeſale or retail; and the adjacent villages are ſupplied by hawkers from the reſpective towns. The mode of conveying the herrings into the interior of Germany is partly by means of the rivers, and partly by land carriage. Herrings ſent to Leipzig, Dreſden, and other parts of the Electorate of Saxony, are carried on the Elbe from Hamburgh to Magdeburg in Barges, and from Magdeburg to Leipzig, &c. they are brought by land. Thoſe ſent to Berlin have

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the whole way water carriage both from Hamburgh and Stettin; herrings imported at Bremen are ſent up the Weſer, and formerly immenſe quantities uſed to be ſent up the Rhine by the Dutch, to Cologne, Mayntz, Frankfort on the Mein, Manheim, &c. whence they were further ſent on the Mein and the Necker into the interior of Franconia and Suabia. Herrings deſtined for Bohemia and Auſtria are ſent by ſea to Stettin, and are thence conveyed in the Oder Barges, as high up as poſſible into Sileſia, whence they are further carried by land.

In regard to the value ſet on different kinds of herrings, a decided preference is given in Germany to Dutch herrings; inſomuch that though Swediſh herrings were latterly ſold at a third and even fourth of what Dutch herrings were ſold for, none but the pooreſt people would purchaſe Swediſh herrings, as long as they could get Dutch, or at leaſt herrings cured in the Dutch manner. The people of Emden and Altona have learnt from the Dutch their method, though they have not hitherto in every point the Dutch excellence; and I have been told by perſons in the trade, that herrings cured by the people of Altona do not keep ſo well as the Dutch herrings.

Of the prices of Dutch herrings, as ſold per barrel in the Dutch ports. I have procured a liſt for ten ſucceſſive years, from 1788 to 1797, which was the laſt year that Dutch herrings could be procured.

Theſe prices were as follows:

Years.	Rix Dollars.	Years.	Rix Dollars.
1788	13	1793	10h
1789	13	1794	17
1790	12	1795	16
1791	12	1796	19
1792	8h	1797	25

When the courſe of exchange is at par, ſix rix dollars are equivalent to one pound ſterling and five or ſix pence; ſo that in

From the firſt Volume of the Tranſactions of the Highland Society of Scotland.

Kippered ſalmon are prepared by cutting them ſmoothly along the back, from the tail to the head. The chine, or back-bone, is then cut out, and all the blood and garbage cleared away. The fiſhes are then ſalted, and laid above each other, with the fleſhy ſides in contact, in a trough, commonly ſcooped out of a ſolid piece of beech, placed in a cool ſituation. A lid, which exactly fits the aperture, is placed above them, and preſſed down by heavy weights. After the fiſhes have imbibed a ſufficient quantity of the pickle, they are ſtretched upon ſmall ſpars of wood, and hung up to dry where there is a current of air. Sometimes they are hung in the ſmoke of a kitchen fire, which preſerves, indeed, but conveys a bad flavour. Some, in order to communicate a particular flavour, mix ſpices with the ſalt; or, they rub the fiſh with ſpices, before they are hung up to dry.

But might not ſalmon, and every ſpecies of freſh-water trouts, be preſerved by ſmoking, in the way hams and ſmoked herrings are preſerved? They might alſo be cured in the way, that what are called *potted* ſalmon, and herrings, are commonly prepared; or in the way the people in Cumberland preſerve their char. The Loch-Leven trouts are conveyed to London, packed in *ice*.

From

From Dr. Fuller's HISTORY OF BERWICK, *p.* 395.

Fifty years ago, the veſſels, employed to carry ſalmon from Berwick to London, generally took ſeveral weeks in performing the voyage. They were *well*-veſſels, of about forty tons burden each. Theſe veſſels belonged to Harwick and Graves-end; and as they came here ſolely on account of the ſalmon trade, they always went away again at the cloſe of the fiſhing ſeaſon, and two of the largeſt remained all the winter, for the purpoſe already mentioned. There are at preſent twenty-one ſmacks employed by two fiſhing companies of this place, in that trade, and in carrying other goods to and from London and Leith.

The conſequence of the ſalmon-fiſhing here, may appear from the following tolerable exact ſtatement. The yearly rental of the fiſheries in the Tweed, for the courſe of a few miles, amounted to between 7000 and 8000l. in which between ſeventy-five and eighty boats, with about 300 men, are conſtantly employed during the ſalmon fiſhery, between the 10th of January and the 10th of October. There have been known to have been 40,000 *kits*, or upwards (of pickled ſalmon), ſent from this town in the courſe of the ſeaſon, beſides a vaſt

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